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In THE MUNICIPAL INDEX (an 875-page annual volume published by American City Magazine Corporation) readers will find much material, including articles, lists and bibliographies on a wide variety of municipal and civic subjects, not published in the monthly issues of THE AMERICAN CITY.

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46 miles of DELAVAUD PIPE are in use for gas and water mains

The progressive spirit of Springfield, Massachusetts is exemplified by a beautiful civic center with a magnificent campanile tower. Springfield's progressiveness is also evidenced by its gas and water systems for which 46 miles of deLavaud pipe have been specified and laid.

For deLavaud pipe is the strongest pipe ever cast. It is a tough pipe too. The metal is dense and fine-grained — remarkably free from slag, blow holes and weakening impurities. Tests conducted by disinterested testing laboratories have proved that deLavaud pipe is at least 25% stronger than good pit cast pipe.

DeLavaud pipe is produced by pouring molten iron into a rapidly revolving cylindrical mold. Centrifugal force holds the metal against the sides of the mold and drives out impurities with a force many times greater than gravity. DeLavaud pipe is a modern pipe for modern conditions and present-day high-pressures. Ask us for facts and figures. The new deLavaud Handbook gives detailed information. Write for a free copy today.

The self-centering shoulder in the deLavaud bell eliminates the requirement of a bead. In laying deLavaud pipe it is only necessary to place the spigot of one pipe within the bell of the next, sliding the pipe forward until it rides upon the taper and automatically centers itself.

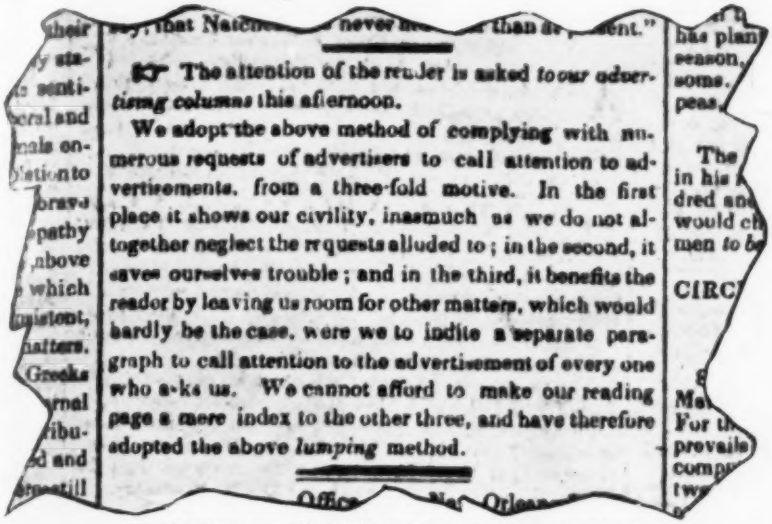
United States Pipe and Foundry Co., Burlington, N.J.

Our pipe bears the "Q-Check" trademark of The Cast Iron Pipe Research Association

Sales Offices: New York, Philadelphia, Pittsburgh, Cleveland, Buffalo, Chicago, Dallas, Birmingham, Kansas City, Minneapolis, Seattle, San Francisco, Los Angeles

The Editor and the Advertiser

1831
1931



☞ The attention of the reader is asked *to our advertising columns* this afternoon.

We adopt the above method of complying with numerous requests of advertisers to call attention to advertisements, from a three-fold motive. In the first place it shows our civility, inasmuch as we do not altogether neglect the requests alluded to; in the second, it saves ourselves trouble; and in the third, it benefits the reader by leaving us room for other matters, which would hardly be the case, were we to indite a separate paragraph to call attention to the advertisement of every one who asks us. We cannot afford to make our reading page a mere index to the other three, and have therefore adopted the above *lumping* method.

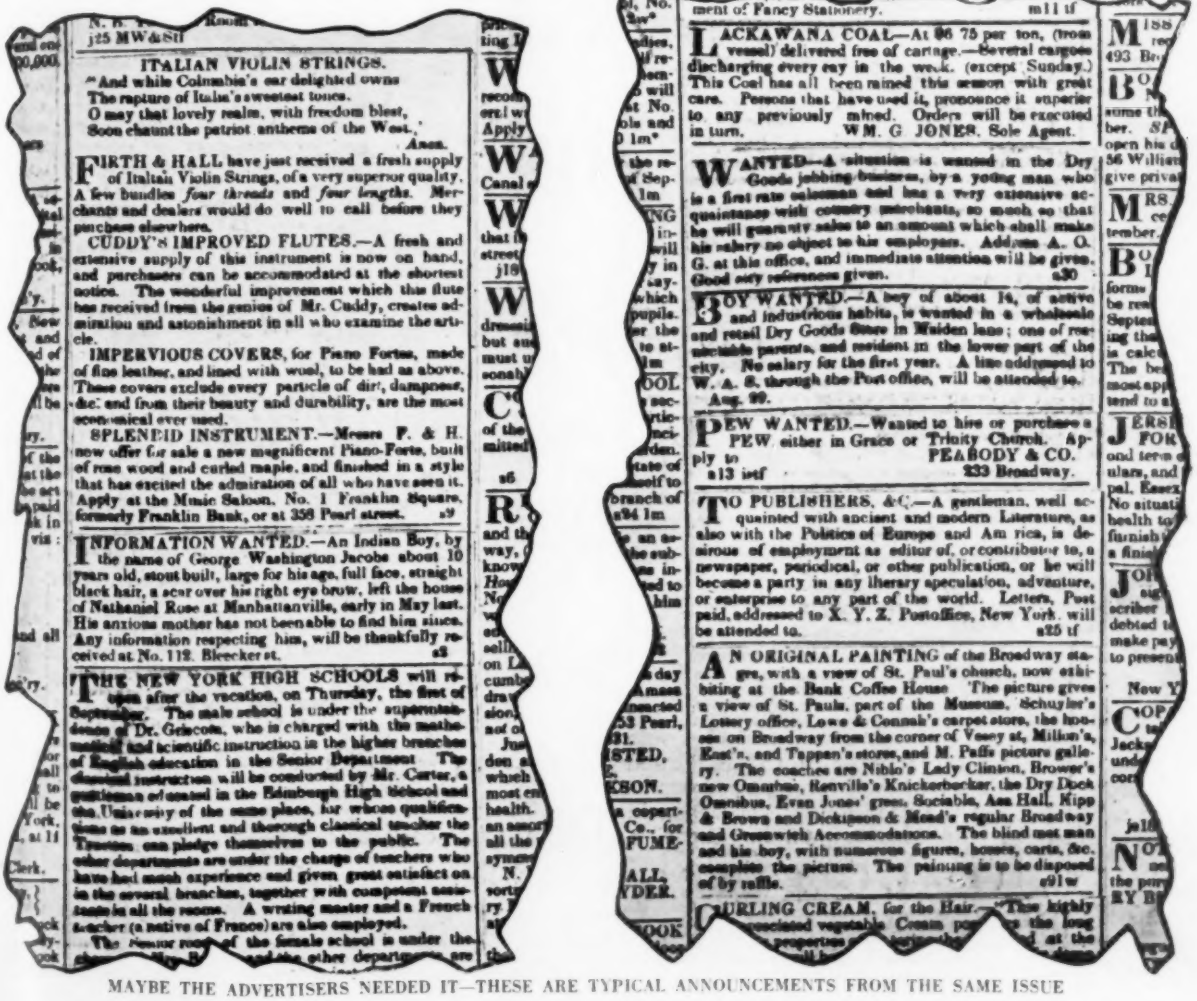
THE EDITOR OF 1831 GIVES HIS ADVERTISERS A BOOST

A Hundred Years Ago

—on September 14, 1831—the *New York Evening Post* published on its editorial page the notice shown at the left.

In those dim and distant days there was, of course, an entire absence of the effectively displayed announcements which characterize the newspapers and magazines today. Below are some of the advertisements reproduced in their original size from this century-old issue.

Could there be a more striking comparison of advance in publicity technique than such advertisements as these, in contrast to the attention-compelling and informative announcements such as our readers are glad to examine in THE AMERICAN CITY from month to month—without any editorial request that they do so?



ITALIAN VIOLIN STRINGS.

"And while Columbia's ear delighted owns
The rapture of Italia's sweetest tones.
O may that lovely realm, with freedom blest,
Soon chaunt the patriot anthems of the West."
Anon.

FIRTH & HALL have just received a fresh supply of Italian Violin Strings, of a very superior quality. A few bundles *four threads* and *four lengths*. Merchants and dealers would do well to call before they purchase elsewhere.

CUDDY'S IMPROVED FLUTES.—A fresh and extensive supply of this instrument is now on hand, and purchasers can be accommodated at the shortest notice. The wonderful improvement which this flute has received from the genius of Mr. Cuddy, creates admiration and astonishment in all who examine the article.

IMPERVIOUS COVERS, for Piano Fortes, made of fine leather, and lined with wool, to be had as above. These covers exclude every particle of dirt, dampness, &c. and from their beauty and durability, are the most economical ever used.

SPLENEID INSTRUMENT.—Messrs F. & H. now offer for sale a new magnificent Piano-Forte, built of rose wood and curled maple, and finished in a style that has excited the admiration of all who have seen it. Apply at the Music Saloon, No. 1 Franklin Square, formerly Franklin Bank, or at 358 Pearl street. s9

INFORMATION WANTED.—An Indian Boy, by the name of George Washington Jacobs about 10 years old, stout built, large for his age, full face, straight black hair, a scar over his right eye brow, left the house of Nathaniel Rose at Manhattanville, early in May last. His anxious mother has not been able to find him since. Any information respecting him, will be thankfully received at No. 112. Bleecker st. s5

THE NEW YORK HIGH SCHOOLS will re-open after the vacation, on Thursday, the first of September. The male school is under the superintendence of Dr. Griscom, who is charged with the mathematical and scientific instruction in the higher branches of English education in the Senior Department. The classical instruction will be conducted by Mr. Carter, a gentleman educated in the Edinburgh High School and the University of the same place, his whose qualifications as an excellent and thorough classical teacher the Trustees can pledge themselves to the public. The other departments are under the charge of teachers who have had much experience and given great satisfaction in the several branches, together with competent assistants in all the rooms. A writing master and a French teacher (a native of France) are also employed.

The Senior room of the female school is under the

ment of Fancy Stationery. m11 tf

LACKAWANA COAL—At $6 75 per ton, (from vessel) delivered free of cartage.—Several cargoes discharging every day in the week, (except Sunday.) This Coal has all been raised this season with great care. Persons that have used it, pronounce it superior to any previously mined. Orders will be executed in turn. WM. G JONES, Sole Agent.

WANTED—A situation is wanted in the Dry Goods jobbing business, by a young man who is a first rate salesman and has a very extensive acquaintance with country merchants, so much so that he will guaranty sales to an amount which shall make his salary no object to his employers. Address A. O. G. at this office, and immediate attention will be given. Good city references given. s30

BOY WANTED.—A boy of about 14, of active and industrious habits, is wanted in a wholesale and retail Dry Goods Store in Maiden lane; one of respectable parents, and resident in the lower part of the city. No salary for the first year. A line addressed to W. A. S. through the Post office, will be attended to. Aug. 29.

PEW WANTED.—Wanted to hire or purchase a PEW either in Grace or Trinity Church. Apply to PEABODY & CO. a13 istf 233 Broadway.

TWO PUBLISHERS, &c.—A gentleman, well acquainted with ancient and modern Literature, as also with the Politics of Europe and America, is desirous of employment as editor of, or contributor to, a newspaper, periodical, or other publication, or he will become a party in any literary speculation, advanture, or enterprise to any part of the world. Letters, Post paid, addressed to X. Y. Z. Postoffice, New York, will be attended to. s25 tf

AN ORIGINAL PAINTING of the Broadway stage, with a view of St. Paul's church, now exhibiting at the Bank Coffee House. The picture gives a view of St. Pauls, part of the Museum, Schuyler's Lottery office, Lows & Connah's carpet store, the houses on Broadway from the corner of Vesey st, Milton's, East's, and Tappen's stores, and M. Paffs picture gallery. The coaches are Niblo's Lady Clinton, Brower's new Omnibus, Renville's Knickerbocker, the Dry Dock Omnibus, Evan Jones' green, Sociable, Asa Hall, Kipp & Brown and Dickinson & Mead's regular Broadway and Greenwich Accommodations. The blind mut man and his boy, with numerous figures, horses, carts, &c. complete the picture. The painting is to be disposed of by raffle. s31w

CURLING CREAM, for the Hair.—This highly

MAYBE THE ADVERTISERS NEEDED IT—THESE ARE TYPICAL ANNOUNCEMENTS FROM THE SAME ISSUE

HORTON TANKS

This new ellipsoidal-bottom Horton elevated tank at Milwaukee, Wis., has a capacity of 1½ million gallons and a height of 86 feet to bottom. In addition to considerable storage in reservoirs, this water system with an average daily consumption of 82,245,737 gallons includes 3,000,000 gallons in elevated storage.

Supply Both Volume of Water and Pressure—Where it is Needed Most

ACTUAL shortage of water is only a little worse than lack of pressure to deliver the water satisfactorily to the consumer. When an adequate reserve is pumped to elevated storage tanks during the night both volume and pressure are assured for the periods of peak demand.

Many cities are finding it advantageous to use district storage in Horton elevated tanks because it enables this reserve capacity to be located where needed. As districts develop, new tanks are added to meet the need without costly main enlargements or additions to pumping capacity.

Horton elevated tanks in shallow depth designs are available in sizes from 20,000 to 2,000,000 gallons, or even larger if desired. With this type all water can be stored at an effective elevation without excessive height. It reduces operating cost because there is comparatively little variation in water level and pumps therefore work against a more nearly constant head.

You may have need of more elevated storage in your water system. Our nearest office will gladly consult with you or your engineers and furnish cost data for estimating.

CHICAGO BRIDGE & IRON WORKS

Chicago.....2127 Old Colony Bldg.
New York.....3108 Hudson Terminal Bldg.
Cleveland.....2236 Midland Bank Bldg.
Detroit.....1501 Lafayette Bldg.
Philadelphia..2616-1616 Walnut Street Bldg.
Boston.....1501 Consolidated Gas Bldg.
Birmingham.....1502 Fiftieth St., N.
Dallas.....1206 Burt Bldg.
San Francisco.....1033 Rialto Bldg.
Seattle.....4343 Smith Tower
Houston.....1101 Electric Bldg.
Tulsa.....2425 Exchange Bank Bldg.
Los Angeles.....1303 Pacific Mutual Bldg.
Havana, Cuba.....Apartado 2507
Cable Address.....Chibridge

AC10-Gray

Pure Water—Man's Greatest Need

Items on Water Supply and Purification

$220,000,000 Bond Issue Voted for Southern California Aqueduct

A VOTE of five to one carried, on September 29, one of the largest bond proposals in water-works history. This is the project of the Metropolitan Water District of Southern California, comprising Los Angeles, Pasadena, Glendale, Long Beach, and nine other cities. Highway and other preliminary work will start immediately. The aqueduct will be about 226 miles long, with a terminal reservoir in Cajalco Hills, and a diversion dam at Upper Parker Canyon. F. E. Weymouth, of Los Angeles, is the Chief Engineer of the District.

Fifty-year serial bonds are scheduled; the first redemption after fifteen years. The cost to taxpayers will be decreased as additional member communities are admitted to the district.

It is hoped that the work will be completed and the aqueduct in operation by 1938.

Water for El Paso Taken from Eleven Wells

IN 1882, the first water-works franchise in El Paso, Texas, was granted to S. Watts, who constructed the Sunset reservoir, now used as a municipal swimming pool, and pumped water to it from the Rio Grande.

In 1902, Watts sold out to the International Water Co., which drilled the first deep well in 1905 in the high ground east of the city, known as the "Mesa." Between 1905 and 1917, 44 wells from 6 to 10 inches in diameter were drilled in that area. The original Mesa pumping plant was steam-operated, but some time prior to 1910, a 550-horsepower diesel engine, costing $125,000, was added. In 1910 the plant was sold to the city of El Paso for $950,000, and the city added two more diesel engines, as well as considerable other equipment.

Owing to the increasing yearly water-supply demand of the city, it finally became necessary either to increase materially the size of the pumping plant and drill several more small wells, or to develop a more satisfactory method of handling the water. It was decided eventually that it would be best to abandon the Mesa pumping plant and all the small wells and to drill new wells of much greater capacity to be equipped with modern deep-well turbine pumps. In 1918 a contract was let for the first of the new wells, and by 1926 enough new wells were in operation to justify the complete abandonment of the old plant, which has been retained as an emergency stand-by unit.

At the present time the entire water supply of the city is obtained from 11 wells ranging from 500 to 860 feet in depth and having a combined capacity of 19,000,000 gallons per day. Between ground surface and a depth of 450 feet, about 50 feet of salt water is encountered, but between the salt water and this depth there are several impervious clay strata which prevent the salt water from reaching the potable water below.

Of the present 11 wells, 8 are equipped with Byron Jackson deep-well turbines, the records of which have been very satisfactory to the city. Each pump is pulled once a year during the winter months and completely overhauled, and pump columns are scraped and painted to prevent deterioration.

The distribution system of the city includes 123 miles of cast iron pipe ranging from 4 to 24 inches in diameter, 602 fire hydrants, and 14,800 services, which are 100 per cent metered. At present there are 5 reservoirs, having a combined capacity of 29,200,000 gallons, and the new Brown Street reservoir, which is to have a capacity of 40,000,000 gallons, is now under construction. The dome of the Jackson reservoir, a circular concrete Hewitt tank having a capacity of 2,300,000 gallons, is 140 feet in diameter and is said to be the largest unsupported concrete dome in the world. The Brown Street reservoir is to have a concrete cover and is thought to be the largest covered reservoir in the United States.

ARTHUR H. WOODS,
Superintendent, El Paso Water Works.

Elevated Tanks Take Care of Peak Demands

THE city of Wauwatosa, Wis., secures its water from five deep wells, all of which are equipped with Layne deep-well turbine pumps, controlled automatically. The supply is ample for average daily consumption, but is subject to high peak requirements, particularly during the summer months in hot, dry weather. Installing additional wells with new pumps and increasing the mains was one solution of this problem, but, after careful consideration, elevated storage was decided upon.

In 1927 a 500,000-gallon elevated tank was installed, and in 1928 a 1,000,000-gallon Pittsburgh-Des Moines tank was built. These tanks take care of the maximum consumption, and the storage is sufficient to permit pumping during the off-peak on the power line.

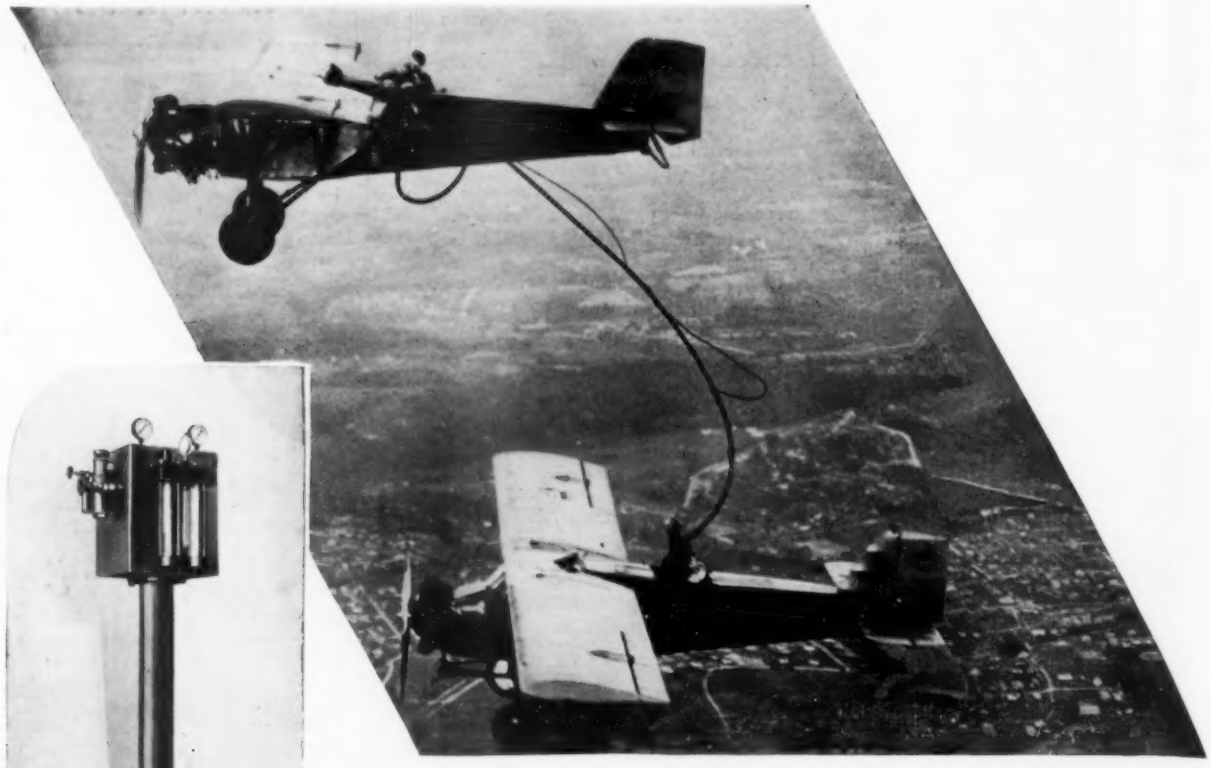
The city has also provided ground storage at three wells in the form of a 1,000,000-gallon steel tank and a 500,000-gallon concrete tank adjacent to two of the wells and a 200,000-gallon steel tank at another. The deep-well pumps discharge into these tanks, the water striking a baffle placed above the maximum water level for the purpose of aeration.

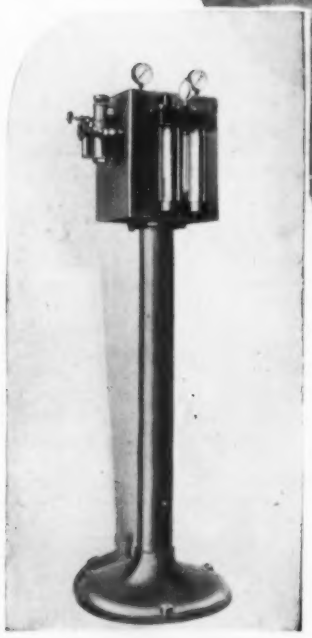
A. W. HEBBRING,
Superintendent of Water Works.

DEWATERING A TRENCH AND REPAIRING A WATER-MAIN BREAK IN WORCESTER, MASS.

On August 12, the Water Department of Worcester worked most of the night repairing a break in the large water main at Main and Walnut Streets. A Homelite pump was used to dewater the trench at the break, which had washed out nearly 30 feet of pavement

Fourteen Thousand Seven Hundred and Sixty Hours . . . . . .





A REAL ENDURANCE RECORD

EIGHT one hundredths of a pound of chlorine every twenty four hours—.0000148032 ounces every second of the day for 615 successive days—that's the endurance record of the W&T chlorinator purchased by the Mitchell, Oregon Water Dept.

Installed by a W&T Engineer twenty months ago, chlorine feed set at .08 of a pound, checked May 5th it was found to be delivering exactly that same amount, and, most remarkable of all, during that fourteen thousand seven hundred and sixty hours of unfailing service THE APPARATUS HAD NOT BEEN TOUCHED.

Such uncanny accuracy, such unfailing service can be yours too if only you install W&T chlorinators.

Send for T. P. 38 and 74.

"THE ONLY SAFE WATER IS A STERILIZED WATER"

WALLACE & TIERNAN CO.

INCORPORATED

Manufacturers of Chlorine and Ammonia Control Apparatus

Newark, New Jersey Branches in Principal Cities

HARRY NEEL, JR.
Supt., Water Dept.
Santa Maria, Calif.
(Appointed 1915)

CARL A. LEIPOLD
Supt., Water Works
Winnetka, Ill.
(Appointed 1924)

ROGER W. ESTY
Supt., Water Works
Danvers, Mass.
(Appointed 1923)

CLAUDE H. WEEKES
Supt., Water Dept.
Fresno, Calif.
(Appointed 1931)

S. D. POARCH
Supt., Water Works
Olean, N. Y.
(Appointed 1929)

Who's Who in Water Supply

The 45th of a Series of Portraits of Water Works Officials Which Has Appeared Monthly Since January, 1928

CARL PETERSON
Supt., Water Works
Huron, S. D.
(Appointed 1898)

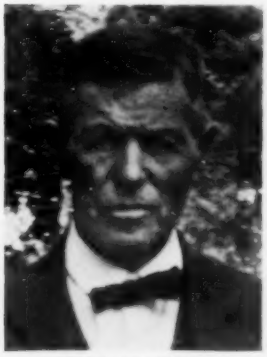
A. T. BLACKMAN
Water Superintendent
Sterling, Colo.
(Appointed 1927)

GEORGE G. DOORLEY
Supt., Water Dept.
Bismarck, N. D.
(Appointed 1913)

D. D. PHELPS
Supt., Water Commission
Pendleton, Ore.
(Appointed 1922)

ARTHUR E. BENNETT
Water Commissioner
Aberdeen, S. D.
(Appointed 1928)

ALBERT C. BUCK
Supt., Water Works
Havana, Ill.
(Appointed 1931)

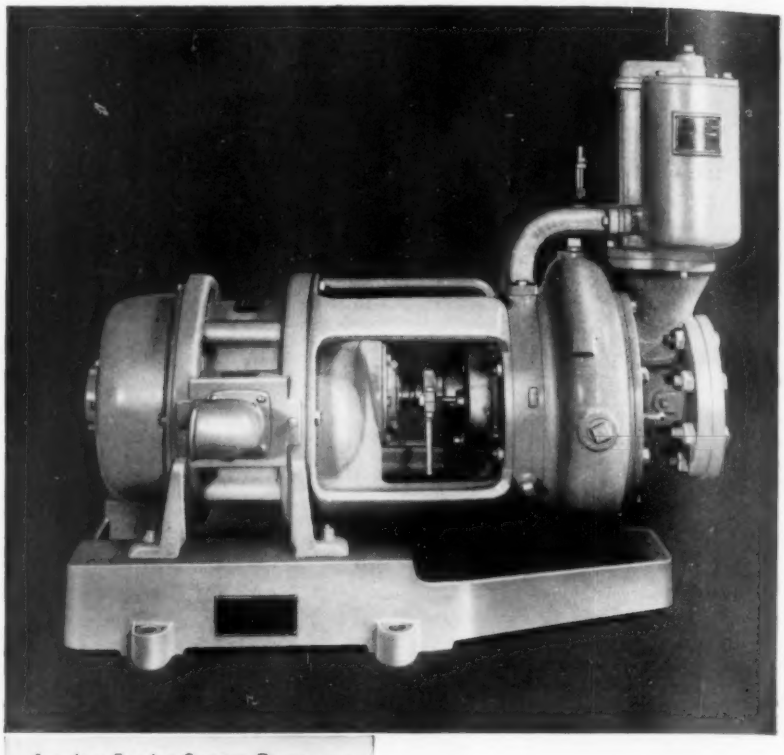


DANIEL W. FLYNN
Supt. of Public Works
Great Barrington, Mass.
(Appointed 1914)

RAYMOND R. NICHOLSON
Sec.-Treas., Water Dept.
Sylva, N. C.
(Appointed 1931)

N. R. HEWITT
Supt., Adirondack Water Works
Lowville, N. Y.
(Appointed 1922)

Accessibility... one of the many advantages of this sewage pump



HANDLING sewage efficiently and without clogging was once the only requirement demanded of a sewage pump. Taken for granted was the necessity for climbing down into the pit to inspect, clean, and service the unit.

The Jennings Suction Sewage Pump has changed all that. It has made accessibility a factor which cannot now be overlooked. For, the Jennings Suction Sewage Pump is always completely accessible. Installed entirely outside the pit, this pump has only the suction pipe submerged. You can get at all the working parts without so much as lifting the pit cover.

For complete information on Jennings Suction Sewage Pumps, write for Bulletins 113 and 124.

Jennings Suction Sewage Pumps are furnished in sizes, capacities and heads to meet all the usual requirements.

VACUUM PUMPS AND COMPRESSORS FOR AIR AND GAS ▸ ▸ RETURN LINE AND AIR LINE VACUUM STEAM HEATING PUMPS ▸ ▸ CONDENSATION PUMPS ▸ ▸ FLAT BOX PUMPS ▸ ▸ CENTRIFUGAL PUMPS ▸ ▸ SUCTION (SELF-PRIMING) CENTRIFUGAL PUMPS ▸ ▸ SUMP PUMPS SEWAGE PUMPS ▸ ▸ PNEUMATIC SEWAGE EJECTORS

NASH ENGINEERING CO.
14 Wilson Road, South Norwalk, Conn.

Jennings Pumps

Mention THE AMERICAN CITY—it helps.

Sewage Treatment Means Clean Streams

SEWERAGE and SEWAGE DISPOSAL

Operating Details of the Bloomington-Normal Sanitary District

THE Bloomington-Normal Sanitary District in Illinois has been in successful operation for a little over two years.

About 541 yards of grit per year, or 45 yards per month, is removed from the grit chambers, the cost until the first of April, 1930, being 35 cents per yard. A dump car was used and it was found necessary to move the track often or to spread the grit by hand or team. Since the first of April, a truck has been used and the grit has been handled at a cost of 20 cents per yard, not only cutting the cost of handling, but permitting the grit to be placed where wanted. Rags and garbage run in excess of 5 yards per month and are hauled off every morning and covered with grit.

The cost of operating the primary settling tanks is about $50 per month. This may seem high, but a large amount of grease and oils was skimmed off the tanks last winter, this being a rather slow and costly job. The flow in the tanks is reversed every week to wash out the flow channels, which helps to keep down odors and reduces grease balls in the Imhoff screens. The tanks are skimmed every morning and the gas vents are hosed down.

About 3,720 yards of sludge per year is removed from the drying beds, about 300 yards being hauled away for fertilizer and the rest being used for fills. Prior to April, 1930, the cost was 50 cents per yard for handling, but since the truck has been used, the cost has been cut to 31 cents per yard. Grit from the grit chambers has been used in place of the fine lake sand on the sludge drying beds and has been satisfactory.

Some trouble was experienced last summer with pooling on the filter beds, which was not helped by flooding the beds. After using chloride of lime for a week, the pooling stopped. The use of chloride of lime once a week was continued for the rest of the summer. This spring its use was begun in April, using about 5 parts per million gallons every 2 hours for 24 hours, once each week. No pools have formed and there are few filter flies.

The operation of the secondary settling tanks costs about $50 per month, plus the power cost. The average pumpage of secondary sludge is about 90 hours per month. The secondary sludge is pumped into the wet well and mixed with the sewage, as this is found more satisfactory than pumping direct to the primary tanks.

H. E. WILSON,
Superintendent, Bloomington-Normal Sanitary District.

New Sewage Disposal System for Berlin

A NEW treatment plant is being completed at Stahnsdorf for the sewage of Berlin, Germany. The daily outflow of sewage from this city is about 150 to 170 million gallons. This is at present pumped through 75 stations to irrigation areas on the outskirts of the city. On the fields the sewage serves as a fertilizer, while the effluent percolates through the soil and, in purified form, is carried away in open conduits.

It is estimated that in the next fifteen to twenty years the sewage outflow from Berlin will be doubled and the present areas used for irrigation fields will no longer be available, but will probably be required for building purposes. Also, it is not now possible to obtain land at a suitable distance from the city at a reasonable price. The city has decided, therefore, to build a disposal plant to treat the sewage by the activated sludge process. The cost of building and management of the new works is estimated at only one-fourth that of the cost of the irrigated field system.

The first section of the plant at Stahnsdorf will deal with 26,000,000 to 40,000,000 gallons of sewage daily. The sewage will first pass through a screen and a grit chamber in which the coarser solids will be deposited. Preliminary treatment in flat-bottomed settling tanks will follow, and then treatment in the activated sludge tanks, where the sewage will be aerated by means of compressed air. The effluent from the activated sludge tanks will then pass to the sedimentation tanks. The clarified supernatant liquor will be discharged to a stream without further treatment.

The sludge discharged to the sludge digestion tanks will remain for several months, and from there will discharge onto sludge drying beds and later be used as fertilizer.

The gas, freed from sulphuretted hydrogen, will be collected in a gas holder, from which it will pass to gas engines housed in a special building. Electric generators, coupled with the engines, are expected to generate sufficient power for the plant and to supply heat and light for a group of 32 dwellings provided for the staff at the plant.

—*The Municipal Review.*

Storm-Water Troubles in Wheaton, Ill.

THE Wheaton Sanitary District is one of the smaller districts in Illinois. Wheaton has no industrial wastes, but a large amount of storm water comes through the interceptors, even though the District has separate storm and sanitary systems.

The sewers were built from year to year in the old days under city control, and where trouble was experienced with the storm drains, they were connected up with the sanitary sewers, and vice versa. The District has removed as many of these cross-connections as could be located, but some must still be in existence, from the fact that within three or four hours after a heavy rain a heavy surge of water is noticed at the plant located three miles west of the city. This must come off roofs or streets, as it comes too rapidly to be merely infiltration.

Two 750-gallon-per-minute pumps were installed in the plant, one for use in dry weather, and both for storm weather. The District has also just completed the installation of an additional 1,500-gallon-per-minute pump.

Early this spring some trouble was experienced with the switches in the digestion room which had become corroded from gas action and short-circuited. A vapor-proof box has been installed, which seems to provide a satisfactory solution.

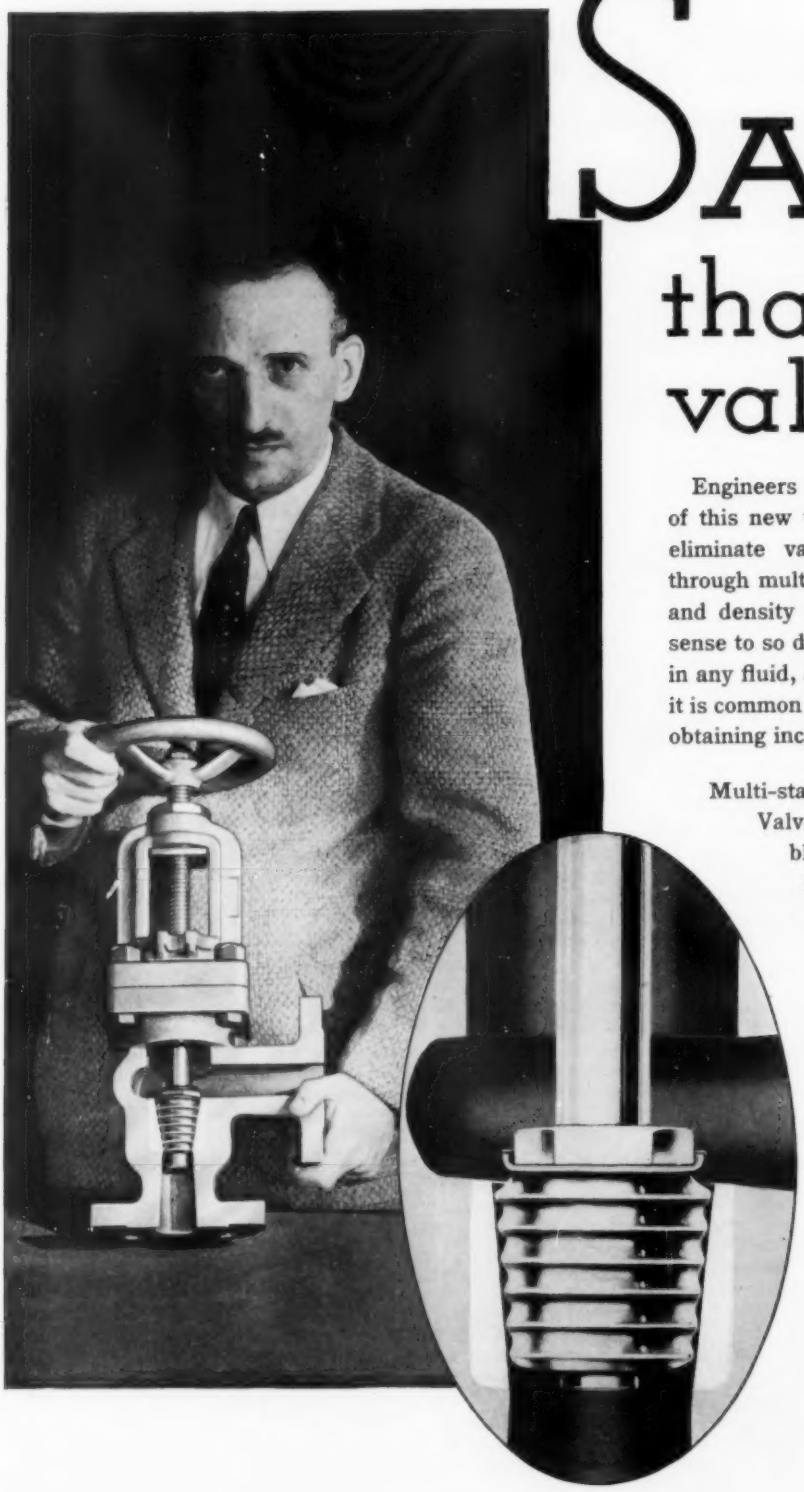
O. G. GETTINGER,
Trustee, Wheaton Sanitary District.

Massillon Requires Use of Wye Branches or Saddle Hubs

IN Massillon, Ohio, if a connection is to be made to the main sewer and no wye branch is available, the city requires that one be inserted if at all practicable. In case it is not practicable, the city requires the use of a saddle hub made especially for this kind of work. The city furnishes these saddle hubs to the sewer tapper at cost.

This requirement has been found to be a big help, as, when the old sewers were laid, insufficient wye branches were provided and, when the time came that the tap had to be made to the main, the workmen were in the habit of breaking a hole in the side of the main sewer, inserting the house connection through this hole and cementing it up. Some complaints were received because of this method of connecting house laterals to the main sewer, for sometimes the work was so carelessly done that the lateral was extended half-way through the barrel of the main sewer, thus forming an obstruction. It is almost impossible for a neat and satisfactory job to be done in this manner, even by expert and careful workmen, and the city requirements for the insertion of wye branches or the use of saddle hubs has materially improved conditions where tappings are made to the main sewer.

C. E. RICE,
City Engineer.



SAY --

that's a real valve

Engineers quickly grasp the common sense back of this new valve design. It is common sense to eliminate valve erosion by removing its cause through multi-stage reduction of pressure, velocity, and density *across the valve seat.* It is common sense to so design the seat that it forms a tight seal in any fluid, at any pressure and temperature. And it is common sense to employ *wear* as the means for obtaining increasing precision and tightness!

Multi-staged for multi-uses, The Ludlow Multi-Valve is at once a perfect throttle, stop, blast and drain valve, and a tight seal for all viscous liquids and solution. Here, in the Multi-Valve principle, will be found the answer to flow control problems at higher pressures and temperatures. Material alone can never be the answer. It must lie in the multi-stage plug and cone — a sound engineering principle that can be applied to your own valve problems.

Engineers who would like to study the matter further are cordially invited to correspond with our Engineering Department. Bulletin 101, which illustrates and describes the valve principle in detail, will be sent at once.

The LUDLOW VALVE MFG. CO.

TROY · · · NEW YORK

1866 · First with the Gate Valve · · TODAY · The new Multi-Valve

When you write for that catalog, kindly mention THE AMERICAN CITY

Construction and Maintenance

Engineering and Highway Departments

Sharp Lugs Damage Oil and Tar Roads

A WARNING against driving threshing machines, tractors or other machines with sharp lugs or cleats over oiled or tarred highways was issued by the Minnesota Highway Department during the early fall of 1931. The warning followed a number of reports of damage by machines on bituminous-treated roads. Tractor owners living near any bituminous roads were urged to get a set of bands or flat rims for the traction wheels. These bands cost from $15 to $30, and they prevent damage to the road surface, save wear and tear on the tractor itself, and facilitate movement on the highways.

Those who do not have the bands are requested to use other roads, even if it involves longer distances. If no road other than a bituminous road can be found, owners of machines with lugs are asked to consult the Highway Department's district maintenance superintendent, if it is a trunk highway, or the county engineer, if it is a state aid or county road. If conditions are such that the trip can be made without damage to the road, a permit will be given. Those who move any machine without such a permit and do any damage to the road surface lay themselves open to arrest, fine, and possible suit for damages.

With nearly 2,000 miles of black-top road in the trunk highway system and a rapidly increasing use of this type of surface on state aid and county roads, protection of these roads is becoming a serious problem throughout rural districts. Great progress has been made in the last ten years in building bituminous roads, and where subsoil and traffic conditions are suitable, a high type of road can be built at moderate first cost. One of the drawbacks is the damage often done by tractors or excessive loads. If tractor and other vehicle owners will cooperate and prevent this damage, it may be possible to extend this type of dustless, waterproof surfacing on thousands of miles of medium and light traffic roads in a few years.

Chicago Bridge Has Light-Weight Concrete Floor

ONE of the annoying bridge problems is that of obtaining a light, permanent and skid-free bridge floor for bascule bridges. The new Wabash Avenue bascule bridge in Chicago has a floor made of a special concrete of light weight, making it skid-proof and safe in wet weather. Large slabs of concrete, 5¾ inches thick and with I-beam chairs imbedded in the concrete, were cast before being placed, the I-beams being then welded to the floor beams of the bridge. These slabs were made by the Benedict Stone Co., of Chicago. By the use of special equipment and processes developed by this company, the special light-weight concrete developed a strength of 7,000 pounds per square inch in compression in 28 days, and the wearing surface concrete a strength of 10,000 pounds per square inch in compression in 28 days.

The light-weight concrete is made by using a special aggregate consisting of heat-treated clay and shale, in place of the ordinary stone. This effects a weight reduction of about one-third.

The Supply House of New Haven City Departments

THE Supply House of the city of New Haven, Conn., is located on Water Street on a plot of about 4 acres of land, running down to the city dock. It consists of one main three-story brick building, which is used as an office building; one large two-story garage where all autos attached to the various city departments are housed; three large sheds and the dog pound.

All city employees report here for work. The working organization of the various city departments at present comprises about 900 men. Practically all the tools and tractors, road rollers, snow-plows and a snow-loader and all other mechanical equipment and auto trucks, as well as construction materials of all kinds, are stored here. The Supply House also contains a blacksmith shop, an auto and tire repair shop, and a paint shop and traffic sign department.

The offices of the Superintendents of Streets, Sewers, Bridges, and Trees, the Chief Inspector of Garbage Collections, the Employment Bureau and the Payroll Department, are all located in the three-story office building.

A. J. GILLIGAN,
Chief Clerk, Supply House.

Operating Costs on Auto Patrol Graders

AN auto patrol grader owned by the New Mexico State Highway Department, after 157 hours of operation, had used 364 gallons of gasoline and 4 gallons of oil. The Highway Department stated that for the first 100 hours of operation the machine averaged 2½ gallons per hour, and after that time it averaged about 2 gallons of gas per hour.

Valley Center Township, Sedgwick County, Kans., reports that its auto patrol grader was operated 156 hours at a total cost of $158.55. Of this amount $98 was for operators' wages. The machine traveled 667 miles, used 405 gallons of gasoline and 7½ gallons of oil. The total cost of maintenance was 60 cents per mile. On some of the township roads three rounds were made. On the basis of miles traveled, the cost was less than 24 cents per mile.

A British View of Road Construction in the U. S.

"THE conclusions arrived at in the United States by the Ninth Annual Asphalt Paving Conference held there recently, on the subject of pavement widening, must strike the English mind as elementary in the extreme. We have so often been assured that "they do these things better in America" that we have no hesitation in proclaiming the fact that, as regards road construction, maintenance and improvement, things are much better done in this country.

"One of the most vulnerable points in a pavement, we read, is the edge, and where traffic volume has grown so as to flow over, maintenance costs rapidly increase, while hazard to vehicle and human life increases as well. In this country we do not suffer much from pavement edges, the majority of road pavements being of width equal to the carriageway.

"To provide for modern needs, three principal methods are employed to obviate the drawbacks arising from concentration of traffic on the paved portion of a roadway. The first is obvious, consisting of the placing of an additional width of similar type. In the second, a course is placed adjacent to the existing pavement and of the same height, followed by laying a new top course over the old pavement as well as the widened area, to obtain an entirely new surface. In the third, the berms are so treated as to permit turning out and back, but with the bulk of the traffic carried on the old pavement. Roads so treated must be but patchwork affairs at the best, and we note with surprise the statement in the report that destruction of an old pavement in order to construct an entirely new one is practically always an unwarranted waste of public funds and can be justified only when an entire relocation in grade and alignment is imperative.

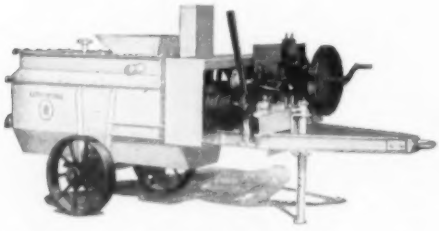
"We quote the following as an illuminating illustration of modern methods. Since—says the report—widening operations with asphaltic types can be carried on in progressive stages, they lend themselves to every degree of traffic and 'every pocket-book.' Crushed stone, gravel or slag can be placed on the shoulders as rapidly as funds permit, 'in layers of any depth, receive compaction under traffic, and be added to as conditions make necessary until thorough consolidation obtains. The final wearing surface can then be achieved either by surface treatment, mixed-in-place, or plant mix methods without delay to traffic and at minimum cost.'"

—From *Municipal Engineering, Sanitary Record and Municipal Motor*, London, England.

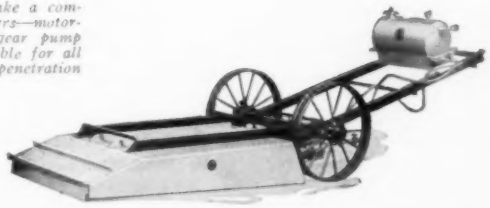
Perhaps, to keep down costs, your town derives to salvage old asphalt. No. 88-OB Reheating Pan is made for that purpose. It has a large pan designed to reclaim old material. It also has a 50-gallon A. C. tank and a place to heat tools.

No. 90 Combination Tool Heater and Asphalt Cement Kettle is the only combination heater having positive draft control between the tool heating compartment and the A. C. Kettle. Fifteen tools can be heated within five minutes and asphalt cement is kept at proper temperature.

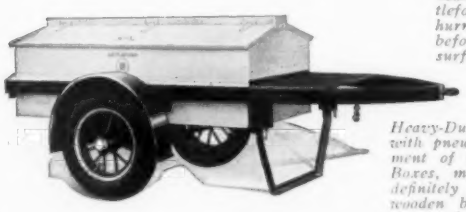
Do you use emulsion? We make a complete line of Emulsion Sprayers—motor-operated and hand-operated; gear pump and pressure pump types—suitable for all kinds of emulsions used for penetration patch work or curing concrete.



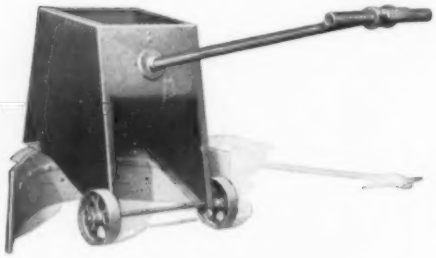
If granite and brick pavings ar used in your locality, then you had better give serious thought to the LB Mechanical Grout Mixer. It is used in connection with Littleford Tar and Asphalt Kettles to mix sand and asphalt for grouting.



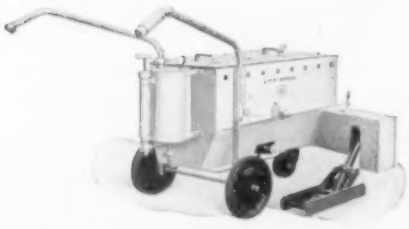
You can hardly get along without a surface heater when repairing asphalt streets. Littleford No. 98 softens the surface in a hurry. It is also used to dry out concrete before putting down asphalt, to heat brick surfaces before pouring, etc.



Heavy-Duty Tool Box No. T-1, equipped with pneumatic tires. Since the development of the LB line of All-Steel Tool Boxes, many highway departments have definitely given up the use of makeshift wooden boxes. They realize that both time and money are saved by protecting equipment in an LB Tool Box.



The No. 82 Squeegee Machine needs no boosting—it is a time and labor saver that has received recognition by the National Paving Brick Association for application of filler and is used extensively by contractors. Many highway departments use it for seal-coating on asphalt and concrete paving.



Very likely your highway department, like many others, has searched for a joint-filling machine that keeps asphalt hot long enough to penetrate to the bottom of the joint or crack. No. 91 Joint Filler does that very thing. It can be fitted with an automatic sanding hopper and an attachment to mark asphaltic center lines.

There is no STOP *to Highway Maintenance*

Through spring and summer, autumn and winter—rain, heat, snow and ice get in their destroying work helped by millions of pounding vehicles; that is what our highways must stand—that is why constant maintenance is necessary.

It is up to your maintenance crews to keep roads free from cracks, ruts and uneven shoulders. Our job is to make the machines that your crews need for such work.

When you need maintenance equipment—asphalt kettles, asphalt or emulsion sprayers, joint fillers or heating torches, it will pay you to get complete information about the LB line of Road Maintenance Equipment.

THE SIGN OF A GOOD HEATER LB LITTLEFORD BROS. CINCINNATI, OHIO

LITTLEFORD

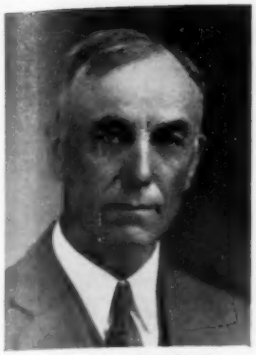
Road Maintenance Equipment

SINCE 1900

LITTLEFORD BROS. 500 E. PEARL ST. CINCINNATI, O.

Who's Who in City & County Engineering

One of a Series of Portraits of Engineering Officials Which Has Appeared Monthly Since April, 1928



JOHN W. MEEHAN
City Engineer
Mount Vernon, Wash.
(Appointed 1926)

T. C. ALSPAUGH
City Engineer
Taylorsville, N. C.
(Appointed 1925)

J. H. BOYTE
City Engineer
Monroe, N. C.
(Appointed 1918)

GROVA C. COOKERLY
City Engineer
Walla Walla, Wash.
(Appointed 1930)

LINFORD C. LULL
City Engineer
Manhattan Beach, Calif.
(Appointed 1921)

J. A. FALLGREEN
City Engineer
Auburn, Sumner Kent City
and Pacific City, Wash.

L. W. MURPHY
City Engineer
West Point, Miss.
(Appointed 1918)

J. D. MORTON
County Surveyor, Charlotte Co.
Drakes Branch, Va.
(Appointed 1907)

CURTIS J. WEPPLER
City Engineer
McComb, Miss.
(Appointed 1931)

WARREN B. RIGBY
City Engineer
Arcata, Calif.
(Appointed 1925)

W. H. CANAN
County Road Engineer, Montgomery Co., Mt. Sterling, Ky.
(Appointed 1919)

HOWARD S. WEGLEY
County Surveyor, Williams Co.
Williston, N. Dak.
(Appointed 1931)

E. L. BRECKON
City Engineer
Ellensburg, Wash.
(Appointed 1931)

FRANCIS L. DUNN
County Surveyor, Nottaway Co.
Nottaway, Va.
(Appointed 1912)

Positive Garbage Incineration *at* Camden, New Jersey

140-ton DECARIE type plant gives adequate service *without* offense to nearby business district

ONLY a few squares from the City Hall in Camden is this DECARIE-type garbage incinerator giving efficient, odorless 24-hour-a-day service. The central location of the plant reduces carting costs to the minimum. The plant is of the well-known *steel-jacketed water-cooled DECARIE type*, the reliability of which has been proved over a period of thirty years by the fact that one-third of all orders received are *repeat* orders.

The D-N Corporation is also able to offer to municipalities other types of refuse incinerator; including brick furnaces and special designs for the disposal of sewage, sludge and screenings. We shall be glad to make a study of local conditions at our own expense on advice from city officials as to which type is best suited to their local needs.

The

D-N CORPORATION

Winston-Salem, N. C.

342 Madison Ave. NEW YORK CITY
205 W. Wacker Dr. CHICAGO, ILL.

Branch Offices

ALBANY, GA. SAN ANTONIO, TEX.
LOS ANGELES, CALIF.

Sales Representatives throughout the U. S. A. and Canada

Sewage Disposal Equipment

In the field of sewage disposal, too, the D-N Corporation is ready to serve municipalities. For the efficient odorless disposal of liquid and solid wastes our line includes *disc screens, chemical tanks and mixers, vacuum filters, clarifiers, stabilizers, pneumatic ejectors* and *screenings incinerators.*

Allow us, at our expense, to make suggestions for a complete sewage disposal plant to fit your local requirements.

Below: A view of the plant at Camden, New Jersey, showing the ease with which trucks can dump their loads of refuse.

METHODS and COSTS of REFUSE COLLECTION and DISPOSAL

Handling Garbage in Mason City

DOMESTIC garbage in Mason City, Iowa, is required by city ordinance to be drained and wrapped and householders are permitted to place tin cans and bottles with the garbage. Ashes and other rubbish are not collected by the city. The domestic garbage is collected twice a week and destroyed in an incinerator. Commercial garbage from hotels and restaurants is collected daily by a private collector, who feeds it to hogs. No attempt is made at salvage.

Domestic garbage is collected by trucks, 1½-ton trucks with dual rear wheels and 4-cubic-yard scow-type steel body with hydraulic hoist being used. There are two men for each of the two trucks, the driver helping with the collection. The city has a population of 24,000 and covers an area of 12.5 square miles. The actual area covered by collection is around 6 square miles, which includes all of the residences except outlying farms.

The average cost of collection is 75 cents and of incineration 35 cents per cubic yard of wrapped garbage. These costs include all operating, maintenance, and repair charges but do not include interest or depreciation on the incinerator and the investment in collection equipment.

The incinerator has been in service since 1918. The furnaces were rebuilt in 1927, and their capacity and efficiency materially increased. Some steam coal is burned with the garbage, about 1 ton for each 70 cubic yards of wrapped garbage. Waste crank case oil from garages and filling stations is also used and results in some coal saving.

P. F. HOPKINS,
City Manager.

Garden Refuse Collected by City

IN Bartow, Fla., the collection and disposal of grass cuttings, leaves, branches and twigs from residences is handled by city collection forces. This type of refuse is collected at the same time as the garbage, the entire collection being dumped into open pits and burned by city employees.

GEORGE J. McNAMEE,
City Clerk.

Householder Pays for Collection in The Dalles

GARBAGE for The Dalles, Ore., is collected by two men who operate a private truck line. The cost, which averages about 50 cents per month during the summer and slightly higher in the winter when ashes have to be hauled, is paid by the individual householder.

The refuse is hauled to a dump ground on some isolated city property about one mile west of the city limits along the river bank. No attempt is made by the city to salvage any of the material, but one man is stationed at the dump to direct the placing of the material. He sorts out what he thinks is of value.

TWO OF TEN COMPLETE TRACKSON-McCORMICK-DEERING BULLDOZER UNITS RECENTLY PURCHASED BY THE DEPARTMENT OF SANITATION, NEW YORK CITY, FOR TRIMMING RUBBISH DUMPS

The table wastes from private homes and hotels are picked up by various farmers and hauled away to their respective ranches for hog feeding. All hauling is done in open-top Ford trucks equipped with dump bodies.

DAVID G. GLASS,
City Engineer.

THE CINCINNATI, OHIO, WASTE COLLECTION DEPARTMENT USES THIS TRACTION HOIST MOUNTED ON A McCORMICK-DEERING TRACTOR FOR HEAVY LIFTING OR PULLING JOBS
It is shown here pulling a disabled truck onto a trailer

New Incinerator in Operation in Montreal

IN the past summer Montreal, Que., completed a new garbage incinerator in the west end of the city, which marks another step forward in the removal and destruction of this kind of waste material. This is the second incinerator built within a year and carries into effect the original plan of having two incinerators, one at the east end of the city and the other at the west end. The total cost of the Sterling type incinerator, which was installed by Bartlett and Snow of Canada, Ltd., was $400,000, including all equipment. The contractors were the St. George Construction Co., of Montreal.

The incinerator has a capacity of 300 tons of garbage a day of 24 hours. It will do away with the large garbage dump on the river front, the noxious odors from which have been the cause of many complaints.

"A Box a Block"

GIVES STATESVILLE, N. C.

96%

BOX ALARMS

CITY OF STATESVILLE
STATESVILLE, N. C.

J. W. MILLS
CITY CLERK AND TREASURER

September 21, 1931.

The Gamewell Company,
Newton, Massachusetts.

Gentlemen,-

It is a pleasure to hand you a statement in regard to our Gamewell Fire Alarm System, which as you know is a "Box in every Block" in our city. We have 100 boxes in our city which has a population of ten thousand four hundred ninety one (10,491). Will say we have in the past 12 months had 103 alarms, of these alarms ninety six (96) % came in over the system.

We are more than pleased with the Gamewell System, and would not think of going back to the old system of telephones. It might be interesting for you to know that our fire area is approximately thirty nine hundred acres.

Yours very truly,

A. Cooper

CHAIRMAN OF FIRE COM.

Statesville, N. C., offers another fine example of what adequate fire alarm box distribution will do for a fire department. Three years ago when that city installed its first fire alarm system, the officials decided that if they were to receive the full benefit from their investment, an adequate number of fire alarm boxes would have to be installed.

Accordingly, it was decided to install a box on every block so that a person discovering a fire would know instantly that a box could be found on the nearest street corner. One hundred Gamewell boxes of the Peerless non-interfering and succession type were distributed throughout this city of 10,491 population. Now that the system has been installed long enough to judge its value, Chairman of the Fire Committee Mr. A. Cooper, states that the city has received 96 per cent of its alarms through the fire alarm boxes during a twelve months' period, and although definite statistics are not available, there has been a noticeable decrease in fire losses.

Examine the fire alarm records of your own city. If the percentage of box alarms is low, it is an indication that you have not a sufficient number of fire alarm boxes. Additional boxes should be installed until you have "A Box A Block" distribution, then as your city grows, a definite number of new boxes should be installed each year to maintain an adequate box distribution. Without that, you cannot maintain a high percentage of box alarms—the safe alarms.

The fire alarm box offers you the quickest and most reliable means of transmitting an alarm of fire.

THE GAMEWELL COMPANY

NEWTON, MASSACHUSETTS

"A Box A Block"

FIRE — SAFETY — TRAFFIC

Items for Departments of Public Safety

No-Parking Zones for Schools Reduce Pedestrian Hazard

MINNEAPOLIS has passed an ordinance which establishes all streets on sides adjacent to schools as no-parking zones from 8 A. M. to 5 P. M. This is particularly significant since records have shown that a large per cent of child accidents have been due to children's stepping out from behind parked cars.

These zones are painted yellow and serve to attract the attention of the motorist as well as to give him a clear vision while passing the school.

Houston Campaign Reduces Accidents

ACCORDING to the Chamber of Commerce in Houston, the campaign being carried on by Mayor Walter Monteith's committee of police officials and business and civic leaders has reduced accidents. During its two months of progress only one person has been killed and fatal accidents have been reduced to 40 per cent.

The Committee is making a special study of traffic ordinances, has issued 50,000 copies of rules and regulations, and has prepared films depicting the right and the wrong way to drive—for showing in the local theaters. Considerable attention was attracted when City Secretary Fred Turner directed traffic over the radio from centrally located points. All motorcycle officers are being given lessons in first aid, and have been provided with first aid kits for emergency treatment of accident victims.

Minneapolis Removes High Planting at Corners

THE Street Traffic Division of the city of Minneapolis is having inspections made by the Street Department men who have completed their regular duties. Whenever an obstruction to vision is noticed, the following form is filled out and sent to the property owner:

CITY OF MINNEAPOLIS
ENGINEER'S DEPARTMENT
STREET TRAFFIC DIVISION

Date .....

.....
.....

Dear Sir:

By authority of the City Council of May 29, 1931, your attention is hereby directed to a serious obstruction to vision caused by too high plantings on your corner. Such obstructions are potential causes of serious traffic accidents in which your family or your neighbor's may be involved.

In the interest of *safety* on the city streets and reduction of traffic accidents, you are requested to remedy the condition *noted below*. This department considers that any obstruction such as a hedge or planting on the corner higher than three (3) feet above the sidewalk line, which may hide a child from an approaching motorist, constitutes a hazard.

Trusting we may have your early cooperation in remedying this condition, I am

Respectfully yours,
J. C. VINCENT,
Traffic Engineer.

Obstructions to vision
.....
.....
.....

.....
Inspector.

Silvertown Safety League Summarizes Traffic Conditions in Different Cities

B. C. CLARKE, formerly publicity man for the National Conference on Street and Highway Safety, has made several traffic reports for the Silvertown Safety League, including reports on Norfolk and Richmond. These are not an attempt at scientific and detailed studies, but are merely an outline of the general situation.

Traffic engineers should welcome this contribution from another interest affected by the traffic problem. It should be valuable in molding public opinion by calling attention to the improvements which should be made.

Fire Prevention Week a Community Opportunity

PRESIDENT HOOVER has proclaimed the week of October 4-10 Fire Prevention Week, and has asked of every citizen in the United States "full cooperation in securing wider understanding of individual responsibility." "For," he declared, "it is only through further elimination of human negligence that lasting progress can be attained." Much has been accomplished through the Fire Prevention Week programs which have been observed in every part of the country since the first term of President Wilson; but that there is still much more to be done through continuous, intelligent fire prevention as a public policy as well as through constant individual effort, is shown by the nation's fire loss statistics. Preliminary figures for 1930 indicate that from 10,000 to 15,000 lives were lost, and that property losses were just under $500,000,000, or approximately $40,000,000 over the previous year.

Fire Prevention Week this year offers to fire chiefs, building inspection departments, and civic and school officials a particularly appropriate point of departure for new programs in the interest of "community fire consciousness."

One-Year Traffic Study of Washington Area

ACCORDING to a release from the United States Department of Agriculture, the Division of Highway Transport of the Bureau of Public Roads, with the assistance of the traffic personnel of the cooperating areas, will undertake a study of the highways immediately surrounding Washington.

The count will cover the number of vehicles, classified by types and indicating direction of movement. At certain locations the origin and destination of motorists will be found by the distribution to operators of franked return mailing cards. These they will be asked to fill out and mail. The number of occupants of vehicles will be obtained, as well as some index of the day's mileage. This activity is evidence of the increasing interest which the Bureau of Public Roads is taking in the traffic problem.

Seek Ban on Firearms

AT the recent annual meeting of the Fraternal Order of Police in Atlantic City a resolution was adopted calling for enactment of legislation forbidding the sale of all firearms except by police permit. "Take away the gun," said E. J. Allen, of Erie, Pa., President of the Order, "and you reduce crime 80 per cent."

For other news items on traffic subjects, see page 117.

Profit from the experience of other police departments

Sergeant Newell, Boston police department, sending the description of a stolen car to 21 district stations. All will receive the message simultaneously in legible typewritten form.

Teletypewriter Service

Do as they do and speed up your alarms by using this machine that sends typewriting by wire!

THE police of New York, Chicago, Boston, Philadelphia, Detroit, St. Louis, San Francisco and hundreds of other cities are now using Teletype. By flashing crime news to outlying stations with lightning speed and in clearly-understandable typewritten form, it has greatly increased the efficiency of many a department.

Says the Commissioner of Police of Buffalo: "Although Teletype has been in service only a short time, the increased protection that we are giving the people of Buffalo is already felt." And the Chief of Police of St. Louis states: "Teletype has become a valuable adjunct to us in combating crime in St. Louis."

The head of the police department of Worcester, Massachusetts, declares: "We are greatly pleased with the results attained from Teletype." While the Police Commissioner of Boston adds: "Teletype has been in use in this department for about two years and we have found it highly efficient and accurate."

Teletype transmits typewritten messages over wires at a speed of 60 words per minute. Every letter or figure typed on the sending machine at headquarters is instantaneously and automatically reproduced by the desired receiving machines in distant stations.

Installations can be arranged so that a description, for example, may be flashed to any one station, to any group of stations or simultaneously to *all* stations. Both the sending and receiving machines make a typewritten copy of the message being sent, thus doing away with misunderstandings and definitely fixing responsibility.

For further information regarding Teletype, consult your local telephone company or write the Teletype Corporation, 1400 Wrightwood Avenue, Chicago, U. S. A.

TELETYPE

SUBSIDIARY OF

Western Electric Company

HENRY R. TAFT
Fire Chief
Norwich, Conn.
(Appointed 1929)

W. LAWRENCE
Fire Chief
Port Washington, N. Y.
(Appointed 1931)

EDGAR GRINNELL
Police Chief
Cortland, N. Y.
(Appointed 1922)

AUGUST D. ALBRECHT
Fire Chief
Island Park, N. Y.
(Appointed 1931)

ARTHUR W. RICHTER
Police Chief
Saugerties, N. Y.
(Appointed 1919)

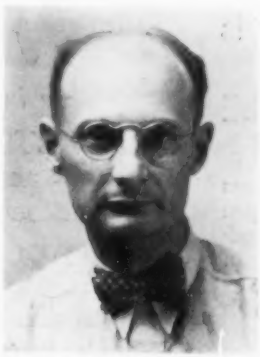
Who's Who in Public Safety

The 44th of a Series of Portraits of Fire and Police Chiefs Which Has Appeared Monthly Since January, 1928

BERTRAM J. DURIE
Acting Police Chief
Spring Valley, N. Y.
(Appointed 1931)

HOWARD L. HUMES
Fire Chief
Ballston Spa, N. Y.
(Appointed 1931)

DAVID E. ELLMORE
Fire Chief
Whitesboro, N. Y.
(Appointed 1922)



J. C. BURRHUS
Fire Chief
Walton, N. Y
(Appointed 1928)

GEORGE MAIER
Fire Chief
Long Beach, N. Y.
(Appointed 1929)

JOSEPH JUDGE
Fire Chief
Corinth, N. Y.
(Appointed 1931)

WALTER SHARP
Fire Chief
Hancock, N. Y.
(Appointed 1931)

GEORGE H. KLEIN
Police Chief
Catskill, N. Y.
(Appointed 1930)

RAY McGUIRE
Fire Chief
Webster, N. Y.
(Appointed 1928)

ANOTHER MAN KILLED

— in an Auto Accident — every 16 minutes

ACTUAL figures show that there are 95 auto accidents every hour — and four of them kill somebody.

Is your community doing its best to check this toll of death? No doubt it is splendidly protected against criminals and gunmen—but how well against *reckless motoring* that kills three times as many citizens? Motorcycle Police have proved the surest safeguard against traffic accidents. Most cities with the best safety records use fleets of Harley-Davidsons. Are *your* streets and highways adequately patrolled?

HARLEY-DAVIDSON MOTOR CO., Dept. M, Milwaukee, Wis.

See the Harley-Davidson Exhibit at the National Safety Congress—Stevens Hotel, Chicago—October 12 to 16.

— the answer is

MORE MOTORCYCLE POLICEMEN

Face the facts and figures squarely. Let us send you a free copy of "The Bloodiest Page in American History". This striking folder will tell you much about traffic accidents, traffic control, and the Harley-Davidson Police Motorcycle. A postcard will bring it.

HARLEY-DAVIDSON

The Police Motorcycle

OCTOBER, 1931

Vol. XLV, No. 4

The American City

470 Fourth Avenue
New York

50 Cents, $4 a Year

Bids for Engineering Services

A Reflection Upon Officials?—or Upon Engineers?

WHEN a municipality needs the services of an engineer as consultant on a water supply, sewage disposal plant, bridge, power plant or city plan, just how should it go about securing the engineer who is properly equipped by education and experience to handle the prospective work?

An unfortunate habit or method has come into existence in the last few years in asking bids for such engineering services. The most notorious case is that of San Diego, Calif., where, on November 17, 1930, the Common Council of the city of San Diego authorized the Superintendent of the Purchasing Department to advertise for bids for the services of a sanitary engineer in preparing plans and estimates of costs for the collection of sewage and the location of sites for its treatment. Protests were lodged by the San Diego, Los Angeles and San Francisco Sections of the American Society of Civil Engineers, but, not withstanding these protests, the Council announced that it would receive bids on December 22. Only one bid was offered, however, and that by a former member of the San Diego Council, who is not an engineer. This bid specified that the contractor would employ a consulting sanitary engineer.

Upon whom rests the responsibility for the asking of bids for engineering services? Both officials and engineers have abetted this lamentable practice. City officials, reared with the idea that all materials should be bought from the merchant making the lowest bid, have carried the same idea into the purchase of engineering services, as though the efficient service of brains, education and experience could possibly be secured in low-bid competition. It is noteworthy that no instance is on record where city attorneys have suggested this method of securing competent engineering services. The attorneys are of a profession comparable to the engineering profession and realize that no adequate legal or engineering services could be secured via the low-bid route.

Unprincipled engineers who would have little chance to secure work if their ability and organizations were compared with those of competent engineers have not infrequently suggested to city officials that the officials ask for bids for certain engineering work, knowing well that engineers of standing would not wish to secure engagements in this manner; thus the incompetent engineer is able to secure the work and apparently save money for the city. But it is usually the case that either the work is unnecessarily extended in time so that the engineer's per diem fee mounts high, or the costs become excessive through lack of engineering knowledge—and in either case the city is the loser.

Proper Procedure in Securing Engineering Services

In order to secure satisfactory engineering service, just how should a city proceed? It is felt that most city officials who have been led into asking for bids for the services of consulting engineers in municipal work have done this through ignorance of the proper method of approaching the employment of a consultant and not through any desire to make a saving in the cost of such services or to prevent the city from securing the best possible engineering advice. To assist city officials THE AMERICAN CITY has prepared the following suggested procedure which has the approval of leading engineering societies, of progressive municipal officials who have seen the losses which cities have incurred in not employing competent consultants, and of a group of eminent consulting engineers:

1. A city wishing to secure a consultant for a specific piece of work should make inquiries of disinterested and qualified persons for the names of consulting engineers whose education and experience qualify them for the work contemplated. These inquiries should be addressed to the editors of national technical journals, to the professional bureau maintained by the national engineering societies with headquarters in New York City, and to officials in other cities where similar work has been completed.

2. Upon securing the names of a few qualified consulting engineers, the city officials should interview the engineers, look over their offices to determine the character of their organizations, and, through discussions with them, determine each engineer's personal qualifications for the work.

3. The officials should secure a record of the education and experience of each engineer, with references.

4. The officials should satisfy themselves by letter inquiry and by visits to some of the engineers' work, as to the truth and quality of the records furnished by the engineers.

5. Finally, an agreement should be made with an engineer for the required service at reasonable terms. Reference should be made to the pamphlet, "Charges for Engineering Services," published by the American Society of Civil Engineers, 33 West 39th Street, New York, which discusses in detail, for the benefit of clients, reasonable fees for various types of engineering services.

As a precaution, may we call particularly to the attention of both municipal officials and city engineers the need of a very specific statement of the type of work to be done for the fee. We mention this because there are engineers who will state rather sketchily that for a certain fee a report will be made.

Let us use as an example an investigation of a privately owned power plant which furnishes electricity to the city and which the city is considering purchasing. One engineer may state that for a certain sum he will make a report on the purchase of the plant, but his letter may fail to state just exactly what the city may expect for this sum, which may be rather low. Another engineering organization will state that the power plant will be examined in detail and appraised, and a fair figure set for its purchase; that, based on this purchase price, the organization will set up a schedule of rates for the sale of electricity which will make the plant self-sustaining. A definite sum is stated for this service. Following this, the engineer will state that, in addition, he will make a schedule of obsolescence for equipment in the plant, showing over a period of years the amount of the sinking-fund necessary and the cost of extending the distribution lines as may be necessary. This and such other services as he may outline he will designate as being available to the city at certain definite additional costs. The city is then in a position to decide just what services it desires at the present time, and can make a suitable arrangement with the engineer, knowing exactly what it will be called upon to pay.

Cutting Fees for Reports

An interesting example of what may be termed "price cutting" by engineers follows. A certain eastern city asked several prominent engineers what they would charge for a report on a new water-works project. The request was not in the nature of securing competitive bids, but rather was a courtesy request, as practically each one of the engineers had, at one time or another, served the municipality on some sanitary engineering work. One conservative, thoroughgoing engineer gave very careful consideration to the amount of personal work required, the size of staff which would be necessary to make the surveys and prepare the report, and submitted a figure of $20,000. Another engineering firm, of equal reputation, submitted a figure of $12,000. It stands to reason that the two organizations could not furnish identical services with such a wide variation in the fee. It may have been that the second organization figured that if it were retained to make the report, it would also be retained to make the plans and supervise the construction of the work. In this case, a small percentage, perhaps only one-half of one per cent, added to the fee for design and superintendence of construction, would more than make up for the cut in its fee for the initial report. It is customary for a municipality to employ the same firm of consulting engineers for an investigation or report and for the completion of the work, particularly if the work is done immediately following the report. There are thousands of instances, however, when the work has been delayed for one reason or another where the first engineer has been paid and his services terminated and another consultant has been employed to prepare the plans and supervise construction. In such cases, the first engineer will necessarily lose considerable money if we may judge his fee by that of the conservative engineer who decided that it would cost him $8,000 more to prepare a thorough report.

Summary

The following resolutions which were unanimously approved at a meeting of the American Institute of Consulting Engineers very well summarize the intent of this editorial discussion. This report was submitted under the title, "Competitive Bids for Engineering Services," and was adopted by the Council of the Institute on June 4, 1930.

1. The selection of engineers through the medium of price competition places a premium upon the choice of that engineer who will generally secure the least resultant value from the expenditures to be made.

2. The services of the engineers are highly professional in that the employing client is dependent upon the good faith, knowledge and ability of the engineer himself to insure thorough and conscientious service.

3. In view of the highly professional nature of the engineer's services, the selection of an engineer by competitive price bids should be classed just as contrary to the best interests of the employing client as would be the selection of a physician or legal advisor on a similar basis.

4. It is frequently found that members of a Board or Commission charged with the duty of selecting an engineer for important work, while fully realizing that such selection should be based upon the ability, experience and reputation of the engineer, are often influenced by other members who confuse engineering services with contractors' bids, which results in a selection on a price basis contrary to the best interests of those who are providing large funds for construction investment.

5. The selection of an engineer because of a low price for the engineering service completely overlooks the important fact that experience and qualified engineering direction of the planning and execution of construction often save many times the entire cost of the engineering service and therefore makes it rather certain that cheap engineering services will result in excessive total cost for the completed work.

IMPORTANT ENGINEERING SOCIETIES

FOR the benefit of municipal officials and other readers of the foregoing article interested in information on specialized engineering services, a list of outstanding organizations is appended:

American Society of Civil Engineers, 33 W. 39th St., New York.
American Institute of Mining and Metallurgical Engineers, 29 W. 39th St., New York.
American Institute of Electrical Engineers, 33 W. 39th St., New York.
American City Planning Institute, 130 E. 22nd St., New York.
American Institute of Architects, Washington, D. C.
American Institute of Consulting Engineers, 75 West St., New York.
American Society of Mechanical Engineers, 29 W. 39th St., New York.

Water Scarce?

Follow Pomona's Lead and Use Sewage Effluent for Irrigation

By **F. C. FROEHDE**
Assoc. M. Am. Soc. C.E.
City Engineer,
Pomona, California

IN the East, the sewerage problem is largely one of sanitary disposal; in many parts of the West, however, sewage is now considered a reclaimable waste having great possibilities in stabilizing a naturally deficient water supply for agriculture and industry.

This idea is gaining impetus particularly in the South Coastal Basin of California, where the increasing population and rapid development of irrigated agriculture and industry have made tremendous demands on its limited native waters. The South Coastal Basin, about 75 miles square, and including all of Orange County, the southern half of Los Angeles County, and western Riverside and San Bernardino Counties, has a population of 2½ million people. In addition, there are approximately a half-million acres under irrigated agriculture. Industrial demands, too, have increased tremendously during the past decade.

Although the water supply for domestic use in Los Angeles has been increased by the Los Angeles Aqueduct, and the projected Parker Aqueduct from the Colorado River will stabilize the supply of other cities for 40 years to come, civic leaders and officials believe that every effort should be made to conserve the waters belonging to the basin.

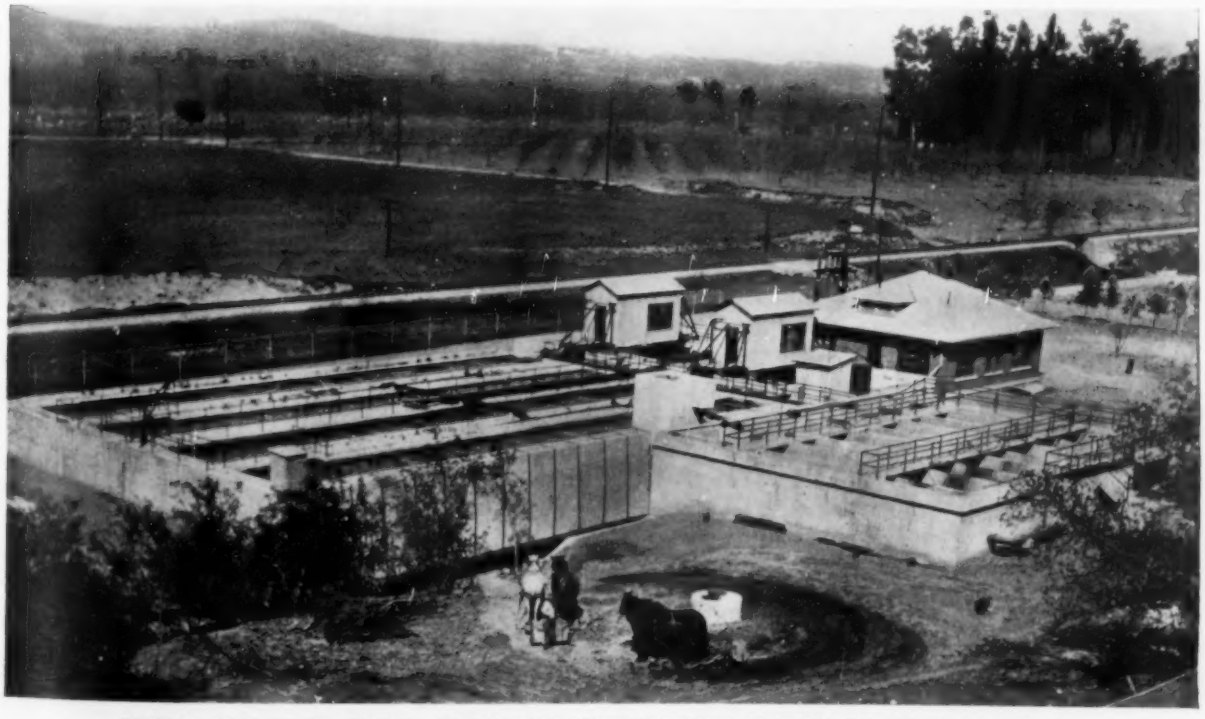
The rectification of sewage, and the use of the treated effluent to replace potable supplies now taken by agriculture, releasing these supplies to city mains, is therefore receiving considerable study. It has been estimated that Los Angeles alone wastes 106,000,000 gallons into the sea each day.

Because of the increasing interest in reclaiming sewage wastes, our plant at Pomona has created a good deal of attention during the past few years. Its operations are considered a small-scale model of what may be accomplished for the entire South Coastal Basin.

We had the idea of conserving and selling water for irrigation purposes before we decided upon what type of sewage treatment plant we would build, as this city is situated in the center of the irrigated district of Los Angeles County. After considerable study, an activated sludge plant was constructed, with an Imhoff tank as a preliminary settling basin.

Activated Sludge Plant Operation

The practice of returning activated sludge to the digestion chambers of the Imhoff tank was not followed out, as it is in Germany. We should find this a very costly



GENERAL VIEW OF THE POMONA CITY SEWAGE DISPOSAL WORKS, SHOWING THE ACTIVATED SLUDGE BASINS AND THE IMHOFF TANK IN THE FOREGROUND
Settling basins are located on both sides of the plant

ACTIVATED SLUDGE BASINS, POMONA CITY SEWAGE DISPOSAL PLANT
These are constructed with beveled sides, to give the sewage a spiral motion as it flows through

operation, because it would be necessary to dilute the activated sludge with water before it could be pumped back, and water is at a premium in this area. Instead, we return the activated sludge to the inflow compartment of the Imhoff tank, where it is mixed with raw sewage. This system is not entirely satisfactory, but we are obtaining fairly good results. We hope to have a separate sludge digestion chamber installed in the future which will take care of this problem.

Our treatment gives a clear effluent which is of better quality for irrigation purposes than much of the water used in the district. To emphasize its purity, I am quoting a part of a report given us by a chemical engineer who made the test without knowledge of where the water came from. He says:

"From the standpoint of mineral matter in the sample, this is satisfactory water for drinking purposes and for other domestic use and for irrigation. The presence of phosphoric anhydride in the amount of 0.55 grains per gallon indicates that the water should be beneficial for irrigation. The nitrogen content of 1.27 grains per gallon is very high, and is, too, of value in irrigation. It is indicated, however, that the water may have been polluted by sewage, and may not be satisfactory for drinking purposes."

Fertilizing Value of Effluent

Of particular interest to growers is its nitrogen content —1.27 grains per gallon. Based on a 24-hour flow, the effluent is carrying 195 pounds of this highly beneficial plant food a day. This quantity of nitrogen is equivalent to the nitrogen content of almost three tons of stable manure each 24-hour period.

Realizing the value of this effluent for irrigation purposes, the Northside Water Co., at Walnut, five miles below our plant, contracted for its use. They are paying an average of three-fourths of a cent per inch an hour, which is much less than the cost of developing water by pumping, the usual practice in that district, and well below the average commercial water rate. They take the water at the plant, having built a 21-inch pipe line 5 miles in length to their property at a cost of over $80,000. The effluent from our plant now amounts to 1,000,000 gallons a day, or, in irrigation terms, a little over 75 inches continuous flow.

Crediting only the sale of effluent and sludge to the plant operation costs, our net cost of treatment during the last fiscal year was $15.04 per million gallons, or approximately one cent an inch an hour. We could handle twice the volume now being treated without increasing the unit cost.

ORCHARDISTS HAVE FOUND THE TREATED EFFLUENT FROM THE POMONA CITY SEWAGE DISPOSAL PLANT OF HIGH QUALITY FOR IRRIGATION PURPOSES

In addition to the revenue derived from effluent and sludge, we have other sources of income which practically pay for the operation of the plant. We receive contributions from the cities of LaVerne and Claremont, as we treat their sewage also.

When the present contract for water expires, there is no doubt that we shall receive far more attractive offers, and it is not too much to expect that the sale of effluent may some day take care of the entire operating costs of the disposal plant.

No Uncertain Sentiment Towards Billboards

"*MOTORISTS do not drive into the country to read on every hand claims made by advertisers for all sorts of commodities and amusements,*" Cornelius R. Agnew, Chairman of the Roadside Improvement Committee of the Westchester County Conservation Association, recently declared, adding: "and the property owners must bear in mind that users of highways pay a large part of the cost of their maintenance. We feel that the public is awakening and will soon make its wishes known."

Mr. Agnew's statements as quoted were made in connection with the recent resolution adopted by the Association in order to prevent any misunderstanding as to its attitude on the question of billboards and other outdoor advertising along country roads. This resolution reads:

"*Whereas*, one of the primary objects of the Westchester County Conservation Association is to restore and preserve the beauty of the roadsides of Westchester County; and

"*Whereas*, outdoor advertising is chief among these disfiguring elements, the spread of which throughout the county is destroying the natural cleanliness and charm of the countryside; and

"*Whereas*, it is apparent that outdoor advertising, unlike some forms of roadside business, is not essential to the well-being, convenience, or comfort of users of the highways, and that it introduces an incongruous and jarring commercial note into any rural or suburban atmosphere;

"*Now, therefore, be it resolved* that the Westchester County Conservation Association is opposed to the existence of any form of outdoor advertising in locations which have not become definitely established as business or commercial centers."

Public Works and Prosperity

New Construction for Cultural Advance—Not for Competitive Manufacture—Is America's Urgent Need

By **DAVID CUSHMAN COYLE**
Consulting Engineer, New York

IT is becoming increasingly evident that prosperity exists in this country only when construction work is in progress on a large scale. There is every reason, accordingly, to examine the obstacles that are blocking construction at the present time, with a view to the discovery of some way out.

Private building for commercial and industrial purposes is at a low ebb, largely because investors realize that there is little real need of new plant. The country generally is pretty well over-built in most lines at the present time. If work is to start on a sufficient scale to bring on prosperity, it seems evident that public agencies must be called upon to start it. Two obstacles stand in the way of the necessary heavy increase in public work.

"Unproductive" Expenditures May Pay Well

The first obstacle is our moral objection to "unproductive" expenditure. It is our habit to distinguish between those public services which pay their way and those which are a drain on the treasury. A municipal water system may show a profit, while a park system shows only expenses. Although the distinction is merely a matter of bookkeeping, since the citizens pay for both, it creates the illusion that the free services are useless luxuries. This illusion is a holdover from pioneer days, when a rapid increase of industrial equipment was the chief need of the country. In those days saving was a civic virtue, and money spent for pleasure was a loss to the growth of the nation. At present, however, our industry is overdeveloped, and it is not productive capacity we lack, but markets. This reversal of the economic background will naturally bring a reversal of our moral judgment in regard to thrift, and the sooner we complete that readjustment the less we shall have to suffer. It is no longer proper to speak of a park system as "unproductive" nor to sniff contemptuously at "made" work. The effect on land values which follows the establishment of parks, churches, libraries, etc., is an indication that the word "unproductive" is a misnomer. Such institutions produce cultural values, and, speaking purely from the economic point of view, the cultural values of the community are the foundation of business. The absolute necessities of food and shelter are a very small fraction of American industry. Business depends on a high standard of living; beauty is of fundamental economic importance.

Not only is a park truly productive if it produces health and pleasure for the citizens and increased land values for the taxpayers. It needs also to be realized that a factory is *non*-productive if it produces only bankruptcy for its owner and unemployment for its workers, throwing them upon the taxpayers for support. It is therefore not only justifiable to spend large sums on parks and museums, it is especially desirable to draw money away from investment in new enterprises that will produce unemployment. As nearly every industry in the country is now over-equipped, it is obvious that almost any new factory or mine serves no other purpose than to add to overhead and bring on depression. For this reason it is coming to be realized that it is not alone necessary to expand public construction to offset the temporary shortage of industrial building. It is also desirable—essential in fact—that for some years to come the growth of cultural plant should absorb capital enough to prevent the further over-building of industrial plant. Construction we must have, but more competition we must avoid. It follows that "what the country needs" is the construction of plants to produce cultural advance, but not to produce goods for sale. That sort of construction is public and semi-public; the more of it, the more prosperous we shall be. The other kind of construction is the over-building of industrial and commercial plant; the less we have of that, the longer our prosperity will last. This is a long way from Benjamin Franklin. We have come a long way.

Whence Shall the Money Come?

The second obstacle to the massive increase of public work is the tax problem. Obviously, if the money expended on parks is taken out of the buying power of the taxpayers, it helps business with one hand while hurting it with the other. It is merely bailing the ocean across the boat. Sales taxes, taxes on real estate improvements, and corporation income taxes are passed on to the consumer and come out of buying power. Feeding them back into buying power through public works is only a partial remedy for the harm done to business by their collection. The legitimate source of funds for a large building program is the great mass of capital which normally would be used in promoting industrial over-expansion. This capital is tapped by the upper brackets of the income and inheritance taxes. These taxes, as Mr. Mellon says, discourage enterprise, that is, competition, and too much competition is what ails American business. It is therefore apparent that national and state governments, which have the power to levy income and inheritance taxes, should be the chief agents in raising funds for a public works program.

It is necessary to look at public work in its true perspective. Construction in all its forms is one of the most powerful causes of prosperity. During the up-swing of the business cycle new building is active, and furnishes a market for industry of all sorts. At the peak, the newly built industrial plants come into action to intensify competition, increase overhead, and destroy profits. Business is poisoned by the effects of over-building, and collapse ensues. Public building, on the other hand, has the same nourishing effect on business while it is in process, without any toxic action after it is done. To transfer capital from industrial construction to public works is therefore to give business a valuable food in place of an indigestible one. It is not a panacea for all our ills, but it is good medicine, and the more we can get of it the better, up to a limit which we are not likely to approach.

The Parkway as a Traffic Artery

Part I

THE BRONX RIVER PARKWAY, BRONXVILLE, N. Y.
The development illustrated above is a part of the Westchester County parkway system. Such a parkway accelerates the speedy movement of large volumes of light traffic

FENIMORE ROAD, BRONX RIVER PARKWAY
The street intersection is generally the key to the traffic problem. Traffic officers, traffic lights, boulevard stops, unregulated traffic, all stop and congest traffic. They also cut down the traffic capacity of the whole system. Separating the grades of intersecting streets, as has been done at the point shown (left), results in more than a doubling of the traffic carried on each street

By **HERBERT S. SWAN**
City Planner, New York

THE automobile has necessitated a complete change in our ideas as to the proper character and use of parks. Before the automobile became commonly used, it was felt that every city should have an appropriate number of parks to enable everybody to enjoy in a contemplative manner a bit of green foliage and flowers. Now, although there has been no depreciation in the enjoyment of such recreation, we no longer stress the necessity for the large park within the city as a means to this pleasure. The automobile and the state and county highways ramifying in all directions put the enjoyment of pastures, green fields and orchards within a few minutes' reach of the outskirts of every city.

The elaborate systems of boulevards and parkways developed in various cities between the seventies and nineties were designed originally as connecting links between large parks. We still believe in large city parks; we still believe in parkways; but the basis for our belief in them rests upon entirely different ground from that of forty or sixty years ago. There is no diminution in the need for large parks. The need for them is increasing. Never has there been a time when there has been a keener appreciation of public recreation than today. All of its forms—golf, baseball, tennis, swimming, skating, rowing, band concerts, dancing—have a stronger hold on a larger portion of the population than ever before, and without the large park, most of these activities and enjoyments are impossible to a great majority of the people. It is for these reasons that the emphasis in the development of the larger city parks is rapidly changing from one of passive relaxation and contemplation to one of active exercise and sport.

—Copyright, Herbert S. Swan, New York.

Need for Rapid Trafficways

A similar change of view has occurred relative to the need for parkways. Although their importance as connections between the various links in the park system is still recognized, the development of a comprehensive system of parkways today finds its justification primarily in the need of the community for rapid trafficways radiating from the center of the city to the suburbs, and connecting the various suburbs themselves with one another. It is becoming increasingly more apparent that the value of the automobile as a means of speedy communication is contingent upon the provision of thoroughfare facilities that will admit of its fullest possible utilization.

Ordinary city streets, not only clogged with busses and trolley cars, moving cars and parked cars, but intersected with frequent cross-streets, afford the automobile little opportunity to assert its maximum usefulness. Being essentially a high-speed machine, the automobile, to function properly, must have, if not a speedway, at least a high-speed roadway. A high-speed car on a low-speed roadway is an anachronism; the two cannot be reconciled or accommodated to each other without distinct loss of efficiency to the automobile.

Parkway Treatment

There is but one solution of this problem and that is to develop high-speed highways for high-speed traffic and to

devote low-speed roadways to the lower-speed traffic. In other words, there should, if possible, be developed, in addition to the ordinary major thoroughfares of the community, an independent system of express highways to care for the fast traffic between main objective traffic points. This means a system of boulevards and parkways laid out with strict reference to the fundamental characteristics and requirements of the automobile—thoroughfares of ample width with infrequent cross-streets, easy grades and free from embarrassing turns or obstructions to the view, and, where possible, a separation of grades at intersecting streets.

In more central locations such parkways may necessarily have to be strictly formal in treatment, with an over-all width as narrow as 200 feet, but in unimproved residential districts they may in many instances readily be accorded a width of up to 250 or 300 feet, or even more. Where circumstances will not permit more, a parkway can even be cramped into a space 160 feet wide; but wherever the width is less than 200 feet, it is felt that the design approaches a compromise of undesirable alternatives. It is far from imperative that parkways be made of a uniform width; they may be made of as varying a width as circumstances permit; indeed, a variable width is capable of less formal and more interesting treatment than a strictly uniform width.

In some instances, of course, a narrow width is necessitated by an existing development which has already proceeded to a degree where a more adequate width would prove prohibitive in expense. Fortunately, however, this situation does not often apply at a distance from the community center, particularly along scenic routes as in valley bottoms, along streams and on top of ridges. In many places they can be made of such a width that playgrounds, tennis courts, baseball grounds, and, occasionally, even wading or skating ponds, may be constructed to afford desirable facilities for recreation to neighboring residents.

Residential Use of Major Thoroughfares

There is another aspect to this whole problem; it relates to the proper physical development of the community. With the increasing use of the automobile, business development has tended to spread out along every major traffic thoroughfare much in excess of actual community requirements for business centers. Five, ten, fifteen, twenty thousand vehicles per day every day in the year is of course not possible over any thoroughfare without a corresponding increase in the incident volume of excitement, danger, noise, dust, soot, gas and fumes. All of these taken together have seriously injured, even ruined, many streets for quiet residence.

Moreover, it cannot be denied that heavy-traffic streets have a real potential value for certain kinds of business. The frontage on busy traffic streets is almost everywhere being converted into business uses.

If this conversion of frontage on every heavy-traffic street to business purposes is to continue, it is obvious that, as time passes, traffic is going to slow down progressively more and more on all our thoroughfares. To remedy this situation, one method immediately suggests itself, viz., prohibit business on such streets. This, it may be urged, can be done through zoning. Although zoning can be utilized effectively in controlling the development of a community, there are distinct limits to its successful application. A satisfactory zoning plan must appraise and interpret natural community trends in development, on the basis of sound economies. It cannot flout those

Photograph by St. Louis Plan Commission

KING'S HIGHWAY MEMORIAL BOULEVARD, ST. LOUIS

That a parkway with roadways serving the abutting frontage invites a business exploitation of the adjacent land is illustrated above

A COMPLICATED INTERSECTION

At the right is a development on the Outer Drive, designed by the Lincoln Park Board, Chicago, to obviate all cross-traffic as well as all conflicting left-hand turns at one of the busiest traffic points in the city

A separation of grades on a street may frequently be of as much, if not more, importance in increasing the volume of traffic carried than the development of an entirely new parallel street. This is probably true at this intersection, where a new street would be wholly impracticable

Photograph by Fairchild Aerial Surveys, Inc.

HUTCHINSON RIVER PARKWAY, WESTCHESTER COUNTY

Separation of grades at intersecting streets, openness of view at all points, easy curves with generous radii, the absence of any privately developed frontage abutting upon the roadway, and beautiful plantings, all combine to make this one of the most delightful highways as well as one of the most efficient carriers of fast traffic in the country

silent, irrepressible forces which derive their strength from a combination of situations stronger than the pronouncements of any statute law. A thoroughfare which, because of its heavy traffic use, is undesirable for residence purposes, cannot be made desirable for that purpose through the mere enactment of a zoning ordinance.

Parkways Indispensable to Fast Traffic

Under the circumstances, there is but one recourse to prevent our high-speed traffic express highways from becoming unneeded business streets and, as a result, slow-traffic streets. We must design these streets in such a manner that their frontage will acquire no business value. In other words, these streets must be so planned that a heavy volume of traffic will not impair the residential use of the abutting frontage. The tendency toward a sporadic and undesirable business development must be checked by making residence the most desirable and profitable use of the frontage.

This end may be effected in large part through a parkway design which provides for no direct traffic outlet from the abutting frontage upon the main traveled highway. But to carry out this idea with the greatest success, there should be either a parked space intervening between the roadway and the property line, or a legal building line established sufficiently far back of the property line to remove residences from the distractions and disagreeable features of the roadway and its traffic. An informal parkway with a varying width is probably best calculated to attain this end. However, a strictly formal parkway of sufficient width may also serve the purpose.

All that is needed to appreciate the difference between a major thoroughfare and a parkway as to both traffic value and frontage development is to contrast, for instance, the conditions on the Outer Drive with those on North Clark Street in Chicago; the conditions on Broadway with those on Riverside Drive in Manhattan; the conditions on Westchester Avenue with those on Bronx and Pelham Parkways in the Bronx; or conditions on the Albany Post Road with those on the Bronx River Parkway in Westchester County.

Scenic Possibilities

The topographic and scenic features of a locality can usually be taken advantage of in the location of parkways. Rivers and creeks, particularly, afford opportunities for the development of attractive as well as serviceable parkways. Although the land within a city may have been subdivided and improved to such an extent that a radical readjustment of the thoroughfare facilities is now impracticable, this situation does not always apply to the suburbs. Here the land is still often held in large tracts dormant in its pristine beauty. A suitable system of parkways should reveal this scenic beauty and also encourage and shape the desirable development of the community.

That a comprehensive system of well-planned parkways would prove of tremendous value to a community in stimulating the opening-up of new areas for development may be accepted as a foregone conclusion. It is hardly saying too much to state that without the establishment of express trafficways to enable the motorist to travel long distances within the shortest possible time, large portions of many towns and cities suffer from a very much retarded development. Indeed, in many instances, particularly in large metropolitan regions, it is a question whether, in the absence of such a parkway system, tracts remote from business centers will ever be developed. But with a parkway system, the portions of the community near the parkways may be expected to enjoy a development for suburban homes corresponding to that which has already taken place nearer the urban center.

BRONX RIVER PARKWAY, FLEETWOOD

For all moderate volumes of traffic a center roadway flanked by service roadways with intervening park strips is more flexible and adaptable to the requirements of speedy traffic than two roadways on either side of a central park strip and serving the abutting frontage

Making the Schools an Increasing Factor in Diminishing Unemployment

By **HELEN WINKLER**
Director, Civic Committee for Adult Literacy, New York City

IN the rush to relieve unemployment last winter, social welfare and placement organizations in New York City became aware of the fact that many men and women who had been the first to lose their jobs threatened to swell the ranks of the permanently unemployed because they lacked the industrial adaptability demanded in an age of skill and the rationalization of industry. It was evident that the situation implied a constantly increasing demand upon the taxpayer to support the volume of "public charges."

Obviously, there are hundreds of thousands among the non-citizens, the illiterates and the near-illiterates who are without adequate vocational skill to secure work and to improve their economic and social status. According to Dr. L. R. Alderman, of the Federal Office of Education, and other authorities, there are in New York City between seven and eight hundred thousand who are near-illiterates.

To meet this situation, the Civic Committee for Adult Literacy was formed late in 1930. This group centered its activity in the establishment of all-day and evening adult schools for vocational training and instruction for those with insufficient elementary education to acquire vocational skill and to qualify for naturalization. Neighborhood houses such as the Henry Street Settlement and Greenwich House, educational organizations such as the Public Education Association and the Teachers Union Auxiliary, labor organizations such as the Workers Education Bureau of America, civic clubs and federations of clubs, and the Coordinating Committee on Unemployment of the Welfare Council, endorsed a concrete plan, recommended to the Board of Education by the Welfare Council, to promote public school facilities for adults in need of training or re-training for jobs that might become available. The Board of Education was ready to help as far as budget and organization permitted.

As there were many vacancies in continuation schools, due to the return of thousands of unemployed working children to high schools, unemployed men and women were invited to enroll in continuation schools for commercial and trade training, and several thousand responded. On careful observation, the Civic Committee found that few illiterates and near-illiterates and non-English-speaking adults were among these students, because the continuation schools, organized as part of a system of compulsory education, are intended for working minors between fourteen and seventeen and presuppose an elementary education and a knowledge of the English language. Also, the evening elementary schools, designed, many decades ago during a time of huge immigration, to teach English to foreigners, neither touch the illiteracy problem nor offer opportunities for industrial rehabitation for the underprivileged worker.

The continuation schools, however, a much later development of the school system, with their close tie-up with industry, vocational counseling, and trade and commercial equipment, and with morning and evening sessions, can be developed to serve the unskilled and unschooled by including in their program instruction for those whose education has been neglected in their youth and those who desire to prepare for citizenship. Furthermore, to serve those who are unemployed because of the economic changes and the present depression, those in need of new occupations, the seasonally unemployed seeking training for slack-season jobs, and persons on part-time or night work, these schools must function in the evening as well as all day.

The beginnings made this year in these schools as an emergency measure, and the experience of other cities, have clearly demonstrated the permanent need for adult vocational elementary education in all-day and evening schools. The saving to the city in expanding the continuation school service to enable hosts of unskilled men and women to find steady employment and become intelligent citizens, with increased earnings, better living standards, and, consequently, greater purchasing power, is evident. This change will be felt in the education of their children and will do much to bridge the purely artificial social gap that now separates the life of the manual industrial worker from that of the commercial worker. The economy of using to capacity the equipment and organization of continuation schools is also obvious. The cost to the taxpayer will be small compared with the saving in the cost of public and private welfare activities designed to relieve unemployment, and in the social and economic implications of insufficient earnings for family needs. The expense will also be diminished by the full use of the financial aid available through the Federal Board for Vocational Education that was created in 1917 to encourage the development of vocational education in the states.

Education of this type, consciously developed in a metropolis, will undoubtedly be reflected throughout the country in many cities with complex industrial populations.

Reduction of Illiteracy a Boon to Business

The most literate states had per capita purchases of $535 in retail stores in 1931 as compared with $248 in the most illiterate states, says Commissioner William John Cooper of the United States Office of Education, as quoted in the United States Daily. "Only 5 per cent of the illiterates deposit money in banks," quotes the Commissioner, "and only 10 per cent of them pay taxes other than poll tax. . . . In illiterate counties merchants carry meager stocks of goods, and these are of the poorer and coarser qualities."

Education creates higher standards of living, with increased wants—which can be satisfied intelligently by those who can read the advertising and other sections of reliable publications.

A PANORAMIC VIEW OF THE NEW SEWAGE TREATMENT PLANT

A Model Sewage Treatment Plant with Attractive Surroundings

By **SAMUEL A. GREELEY**
Pearse, Greeley & Hansen, Engineers, Chicago

THE Peoria, Illinois, sewage treatment plant is of the aeration type, with separate sludge digestion, and has a rated capacity for 22.0 million gallons per 24 hours. Fifty acres of Illinois River bottom land have been reclaimed and parked for the treatment plant site. Ample clearance and special arrangements for flexible operation are provided, with recording instruments for al major operations. The following are the steps in the treatment of the sewage:

(a) Mechanically raked bar screens.
(b) Automatically operated vertical centrifugal pumps.
(c) Rectangular grit chambers with mechanisms for removing and cleaning the grit, with coarse bar screens at the inlet.
(d) Square primary settling tanks with mechanisms for removing sludge and floating solids.
(e) Aeration tanks for the nitrification of organic matter.
(f) Square final settling tanks with mechanisms for removing sludge.
(g) An ample operating and control gallery between the aeration and final settling tanks.
(h) Mechanically equipped sludge digestion tanks with central building for operating control.
(i) Low-cost open storage tanks for winter storage of digested sludge.
(j) Open sludge drying beds.
(k) Submerged outfall into the Illinois River.

The sewage contains a relatively large quantity of industrial waste and it was considered desirable to provide for some measure of flexible operation.

The plant is located on the Illinois River at the southerly limits of Peoria, within a ring levee which protects 50 acres of bottom land from high water. The arrangement and spacing of units is such as to provide readily for extensions within the available area.

Preliminary Investigation

The general scheme of intercepting sewers and sewage treatment was based on a series of progress reports which made record of the preliminary investigations, including population, sewage quantities, industries, sewer routes, treatment plant sites and types, and river studies. Summaries of these reports with estimates of cost were published in a small printed booklet and were the basis of the financing program.

Plant Loadings

The major plant loadings used as basis of design are as follows:

(a) The intercepting sewer has a capacity for 392 g.p.c. from the estimated future population of 227,858.

RECENTLY COMPLETED AND PLACED IN OPERATION AT PEORIA, ILL.

(b) The present treatment works provide capacity for the human sewage of 140,000 people estimated at 14.0 m.g.d. and, in addition, 8.0 m.g.d. of industrial sewage, making a total of 22.00 m.g.d.

The population equivalent of this sewage is not as yet determined, but is estimated to be, at times, in excess of one million. The various plant structures are rated between these limits with reference to present river requirements and considerations of cost, as stated below.

Pump and Blower House

The sewage enters a screen well and passes through a vertical bar screen with 2⅝-inch clear openings mechanically cleaned by moving rakes made by the Newport News Shipbuilding Company, and thence to the wet well. There are five vertical centrifugal pumps of the following capacities: two at 14 m.g.d., two at 22 m.g.d., and one at 33 m.g.d.

The blower plant includes one Connersville positive pressure blower with a capacity for 15,000 c.f.m. and two DeLaval centrifugal blowers each with a capacity for 10,000 c.f.m. The total blower capacity of 35,000 c.f.m. is equivalent to 2.27 cubic feet per gallon of sewage with a flow of 22.0 m.g.d. The air is filtered through oil and felt filters placed in series. Piping connections and space are provided for future units.

Screen and Grit Chamber

The pumps deliver the sewage to the screens ahead of the grit chamber. The bars have a clear opening of 1½ inches and are cleaned by hand. The screenings drop into a concrete hopper which empties itself directly into a grit car below.

The grit chamber has two flowing-through channels equipped with Link-Belt mechanisms for removing and washing the grit. These mechanisms discharge continuously into the concrete hopper into which screenings are raked. Each grit chamber channel is 40 feet long and 9 feet wide, with an average liquid depth of 5.7 feet. The grit appears to be very good, with an ash content of over 75 per cent.

Primary Settling Tanks

There are four primary tanks (see page 90) equipped with Dorr traction-type mechanisms for removing sludge and light floating matter. Each tank is 65 feet square with a liquid side depth of 10 feet. The displacement period is 1.5 hours at rated capacity. Skimmings are swept by the mechanisms into separating manholes from which the oily matters can be removed for disposal by burial or burning. The primary tanks are not housed, but have ample space about them to facilitate operation. The influent conduits are aerated to prevent deposits.

Aeration Tanks

There are four aeration tanks of the spiral flow type. Each has three flowing-through compartments 190 feet long. The compartments are each 23 feet wide, with a liquid depth of 15.5 feet, providing a displacement period of 5 hours at 22.0 m.g.d., plus 20 per cent return sludge. Each tank has three rows of aeration plates and the plate area is 9 per cent of the tank area.

Operating Gallery

The twelve flowing-through channels of the four aeration tanks terminate in the operating gallery, in which the distribution of sewage, air and activated sludge is controlled through an ample number of valves and meters. The operating gallery is 290 feet long and 20 feet wide, with a height of 19 feet. There is a sludge pumping station at each end, each comprising two return sludge pumps at 6.5 m.g.d. and two waste sludge pumps at 0.5 m.g.d. At the south end are located the

A VIEW OF THE PEORIA PLANT, LOOKING OVER THE ILLINOIS RIVER
The primary settling tanks are shown in the foreground, the aeration tanks, sprinkling filter and final settling tanks in the background

two main drainage pumps which lift rain and seepage water over the levee. Four small buildings provide access and house the meters. The piping is so arranged that sewage with a greater or smaller proportion of industrial waste can be introduced at either end of the gallery and delivered to one, two, three or four aeration tank units. Excess activated sludge is pumped either to the influent conduit of the primary tanks or direct to the sludge digestion tanks.

Final Settling Tanks

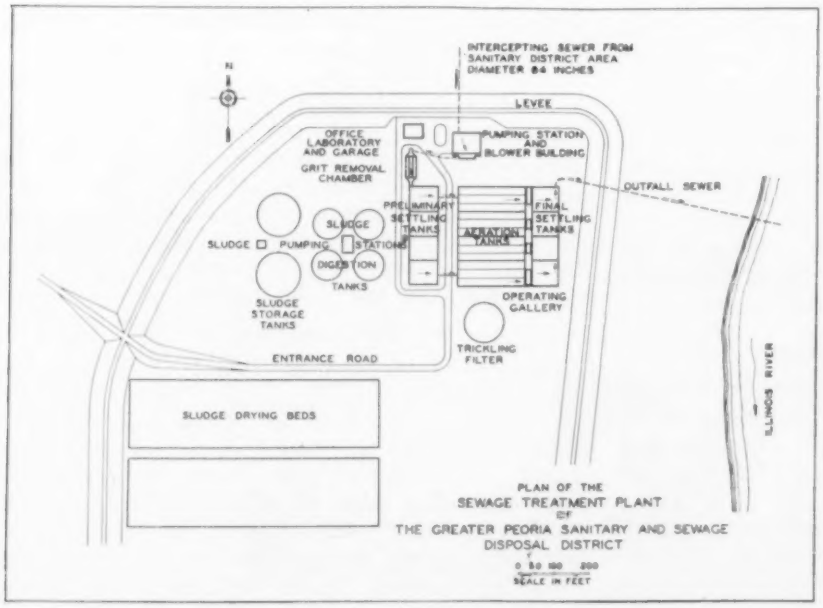
There are four final settling tanks equipped with Dorr traction-type mechanisms for removing sludge. The tanks have a side depth of 12 feet and an area sufficient to give a settling rate at 22.0 m.g.d. of 1,200 gallons per 24 hours per square foot of tank surface, and a displacement period of 2.25 hours. The final effluent is decanted by a U-shaped trough providing 220 feet of take-off for each tank weir, which provides very satisfactory clarification.

Sludge Digestion Tanks

Four heated sludge digestion tanks, each 85 feet in diameter and 29 feet deep, provide 660,000 cubic feet of controlled sludge digestion capacity; or 0.66 cubic feet per capita for a population equivalent of one million. Each tank is equipped with sludge-removal mechanism, heating coils, gas collectors, etc. These tanks are built above ground water level and are surrounded with earth embankments to reduce heat losses.

Sludge Control House

The possibilities of very high gas production (it reached 97,000 cubic feet per day in 6 weeks) and the variable characteristics of the mixed sewage, led to the design of a central sludge control house three stories high and 30 by 48 feet in plan. On the bottom floor are five sludge pumps, all interconnected to facilitate the handling of raw sludge or digested sludge from one tank to another or to circulate it within the same tank. On the next or intermediate floor are the hot water circulating pumps, and on the upper floor, the heating boilers with a capacity for keeping the temperature in the digesting sludge up to 130° F., if desired. Each tank has a continuously recording thermometer and temperatures have so far been maintained between 88° and 92° F. Provision is also made for sampling sludge at each pump. The digestion tanks and piping are so arranged about the control house that additional tank units can be added to the north or south when needed.



Sludge Storage Tanks

So as to keep down the capacity of relatively expensive sludge digestion tanks, two sludge storage tanks were built for digested sludge produced during the winter months when it can not be placed on open drying beds. Each of these comprises an inner shell with concrete backing on the outside, and cost only 11.7 cents per cubic foot capacity. The total sludge storage capacity is 850,000 cubic feet. There is a small pumping station between the two tanks for emptying and to facilitate the distribution of sludge.

Sludge Drying Beds

Open sludge drying beds have an area of 6.45 acres, or 0.25 square feet per capita, based on a population

equivalent of one million, which is properly balanced against the capacity of the other plant units. There are 28 beds 50 feet wide and 200 feet long, equipped with narrow-gage track for the removal of sludge. The sludge is introduced from a conduit at the center of each battery.

Administration and Laboratory Building

The lower floor of this building provides a garage and housing for the sludge locomotive. The upper floor comprises a large, fully equipped laboratory and three private office rooms, one of them large enough for Board meetings. The building is 36 by 53 feet in plan, and the main laboratory is allotted 930 square feet. It has been fully equipped, and analytical records started with the day sewage was turned into the plant.

Trickling Filter

Owing to the unusual character of the sewage, the design included a circular trickling filter with a revolving distributor. The filter area is ¼ of an acre and provides capacity for about 5,000 population equivalent. The filter is divided into four equal sections in each of which is a different size of stone or gravel. It can be dosed with settled or with partially aerated sewage. It will afford useful data when the time comes for enlarging the plant.

Landscaping and Architecture

While the design was directed more especially toward the general arrangement of all plant units and to the details of each structure with reference to facilitating operation, attractive buildings and grounds were not overlooked. A simple, sturdy, brick superstructure was used throughout, with ample light and accessibility. A reasonable amount of landscaping has been provided, following plans by Irving I. Peterson. It is considered that well-kept grounds stimulate good operation and are well worth the relatively small cost.

Cost

The Peoria sewage treatment plant cost $1,700,000, including the levee and all plant structures. On the basis of human sewage, it has a capacity for 22.0 m.g.d. equivalent to a population of over 200,000, except that the sludge tanks and drying beds have capacity for a very much larger population equivalent. Unit costs are, therefore, not directly comparable. On a population basis, the cost per capita is about $7.70, and per million gallons, about $77,000. These are relatively low figures. The character of construction is excellent and the general contractor, J. L. Simmons, of Bloomington, Ill., did a very creditable job.

INTERIOR, MAIN PUMPING STATION
The view is of the pump and blower room

Operation

It is too early to comment at length on operation, as the plant only went into operation toward the end of May, 1931, and equipment tests are still in progress. The plant hydraulics are as designed, and flows are satisfactory. All of the many pieces of equipment have gone into operation with very little trouble. Typical analyses for the summer of 1931 are as follows:

	Crude Sewage	*Final Effluent*
Suspended Matter	235	12.
Oxygen Consumed—		
5-Day B.O.D.	174	6.0
Nitrogen—		

ANOTHER VIEW
The office and laboratory building, grit chamber, pump and blower building, and a corner of the primary settling tanks of the Peoria plant

	Crude Sewage	*Final Effluent*
Total Org. + free NH	25.0	2.4
Nitrates and Nitrites	0.0	6.4

Two of the sludge digestion tanks were started by filling them about one-third with water and heating them with a vertical portable 60-hp. boiler. About 45 tons of coal and 3.6 tons of lime were used between May 21 and June 22, 1931, at which time there was sufficient sludge gas for maintaining temperatures in the digestion tank. At no time has light scum foamed out of the tank.

Personnel

The Peoria Sewage Disposal Works (including intercepting sewers, treatment plant and appurtenances) were designed by Pearse, Greeley and Hansen, who also supervised their construction and who are retained as consultants during operation. John R. Longley was Resident Engineer during construction and has been appointed District Engineer in charge of operation. The Trustees of the District are Emmet C. May, Robert J. Phalen and F. Roy Miller, and the Attorney, A. L. Anderson.

Mechanical Snow Loaders Prove Worth to City in Heavy Snowstorm

By E. A. MILLER
Supervisor of Maintenance,
Department of Public Works, Rochester, N. Y.

THE storm that raged over most of the northern portion of the United States from March 8 to 10, 1931, buried the city of Rochester, N. Y., under the heaviest March snowfall recorded in 15 years. From 1 A. M. Sunday, March 8, to noon Monday, March 9 a total of 13 inches of snow had fallen, and snow continued to fall in flurries most of the next day.

A few years ago, this storm would have paralyzed the community for days, but, warned by United States Weather Bureau reports, the city's modern snow-fighting equipment was mobilized and all thoroughfares were kept open throughout the storm. Five hundred unemployed men were put to work in addition to the city fleet of 60 roadway plows and five Barber-Greene mechanical snow loaders, plus forty 8-yard dump trucks, and the battle against the storm was carried on unceasingly throughout the 40 hours of its duration. The snow was heavy and wet, making handling more difficult.

Start One Hour After Storm Began

Shortly after 2 A. M. Sunday, the first steps were taken when 100 horse-drawn sidewalk plows and 50 roadway plows were sent out. At 6 A. M., a crew of 100 shovellers was dispatched to clear sidewalk crossings and bus and trolley stops. Between 11 A. M. and 1 o'clock, 3½ inches of snow had accumulated and it was necessary to send out the equipment again with 100 fresh men. In the afternoon, the five snow loaders, including a new machine just delivered the day before, were put to work.

Snow-plows cleared traffic lanes on the main streets, windrowing the snow along the curb line. Loaders worked along the windrows, filling the 35 trucks which hauled the snow to the Broad Street and the Bausch Memorial Bridges, from which it was dumped into the Genessee River. A hundred men were employed at these points.

In spite of the great number of hand shovellers available, the loading of trucks was accomplished almost entirely with the Barber-Greene machines because of their greater speed and capacity, essential qualities to a snow-fighting unit. It took half an hour to load an 8-yard truck by hand, when 10 such trucks were loaded in the same length of time by a loader. The cost of mechanical loading was 5 cents per truck as against $1.35, the cost of hand loading.

The snow loaders worked 383 hours and handled 7,175 loads, or 57,400 yards of snow. The maximum period of continuous operation for any machine was 23 hours. During the process of keeping traffic moving, the loaders cleared 70 miles of Rochester streets, and it is estimated that the latest machine—the one which arrived the day before the storm—virtually paid for itself in the service rendered during this one snowfall.

The city of Rochester was one of the early municipalities in the United States to use mechanical snow-loading machines, installing their first Barber-Greene machine in October, 1924.

Although the March storm, which brought the whole month's average precipitation in a single snowfall, caused acute distress to traffic in country districts, Rochester, thanks to the early mobilization and unceasing effort of its snow-fighting forces, was able to keep its streets open throughout the entire city.

How New York State Cities Are Economizing

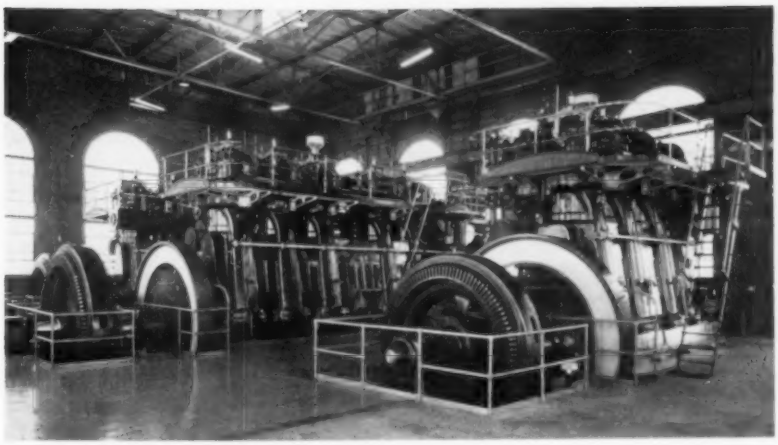
FOR many years the cost of government in the cities of New York State has shown a steady increase. Over a ten-year period this increase has approximated 80 per cent, with an average annual increase of about 7 per cent.

It is therefore interesting to note that the total net budgets of New York State cities for the year 1931 indicate an increase of less than 1 per cent over the amount appropriated for 1930, and that in 25 cities the net budget has been decreased. This reduction has been made in spite of greatly increased demands for charitable and unemployment purposes and in the face of a decided decrease in revenues received.

W. P. Capes, Secretary of the New York State Conference of Mayors, says: "This is a splendid showing when we consider that twenty of these cities have had to appropriate approximately $600,000 for old age security; that all have had to increase municipal funds for outdoor relief; and that every city has had greatly to reduce its estimate of revenues to be received from taxes collected by and shared with the state, such as the corporation franchise and personal income taxes. In addition, many of the cities have this year had to provide in their tax levies additional funds to pay principal and interest on money borrowed last winter to provide work for the unemployed."

E. D. GREENMAN.

A Municipal Power Plant Built from Profits



By CLARENCE HOEN
General Superintendent,
Municipal Water and Electric Department,
Carthage, Mo.

EARLY in 1931, Carthage, Mo., dedicated its new municipal diesel-engined power plant, which is a masterpiece in design from the standpoint of diesel engineering practice and a valuable asset to this city of 10,000 population.

This new plant is the outgrowth of a steam plant built in 1898. In that year, bonds to the amount of $25,000 were voted for the purpose of constructing a municipal electric plant and distributing system. Two 90-kw. belt-driven generating units were installed. In 1907, need arose for greater capacity and bonds were again voted to the amount of $225,000 for the building of a new water plant and distributing system. At this time, the water and electric plants were combined and a 300-kw. cross-compound Corliss generating unit was installed. These two early bond issues have long since been retired.

Old Plant Inadequate

When this plant was built, the site was believed adequate for all time. It occupied a triangular piece of land, on one side of which was the Frisco Railroad, on another side a city street, while on the third side was Carter Branch, a small stream which occasionally overflowed its banks during periods of heavy rains. On several occasions service was badly crippled because of a flooded engine room.

With this equipment the plant continued to give service for the next ten years. A gradual increase in the cost of fuel during this period, combined with a growing load, presented a serious problem. Not only were the profits materially reduced, but the generating equipment was no longer adequate in size. An actual operating loss of $57.37 was shown in 1920. It was evident that some steps toward greater economy in operation would have to be taken quickly, if the municipal plant was to continue in service.

About that time, the diesel engine was beginning to gain favor as a power unit to provide electric service. By turning from steam to diesel, it was believed that considerable savings in operating costs could be effected. After some investigation, it was decided to purchase a 750-hp. Nordberg diesel engine. The first year it was in service, the plant showed a profit of approximately $48,000, as against a loss the preceding year with steam equipment. The fuel cost to produce a kilowatt-hour was 0.8 cents with diesel and 2.1 cents with steam. This first three-cylinder engine carried the burden of the load for the next several years, when it again became necessary to install additional generating capacity. This time a five-cylinder Nordberg engine was purchased, of the same type as the original installation, but of 1,250 hp. With the entire load being carried on the diesel units, the plant began to return a substantial profit. The second engine, together with other plant and distributing system improvements, was paid for from earnings.

New Plant Considered

In 1927, conditions again arose when it was felt that changes in the power plant were required. The load had grown almost to the capacity of the two diesel units; furthermore, the plant had grown inadequate for a city the size of Carthage. Its operating qualities were not in keeping with modern diesel power-plant practice. Investigation showed that the old building could not be made suitable without considerable expense and even then the result would have been more or less a makeshift. Besides its being built as a steam plant, the unfavorable location and lack of room for expansion were difficulties which remodeling could not overcome. The necessary alterations to the building would have cost about $35,000, which amount, it was believed, could be better applied toward a new building suited to the city's needs.

Across the railroad from the old plant the city owned a tract of 4½ acres, lying above the flood waters of Carter Branch. This tract was ample for any future growth of the electric and water departments and also afforded an excellent setting for the type of building under consideration.

Construction of the new building was started in August, 1927. Except for a fee of $250 for architectural assistance, the design of the building, layout of all equipment and piping, building supervision and installation of all new equipment was done by those in the employ of the city. The building was built by day labor hired locally, except for contracts for the steel erected, roof, cut stone and stone setting. The work done by city-employed

forces included excavation, building of forms, concrete work, laying brick, glazing, painting, outside walks, landscaping, etc. All this was done under the supervision of the General Superintendent, who has complete charge of both the electric and water departments.

New Plant a Model of Its Kind

This new power plant is distinctive in appearance, and a credit to the community and to municipally owned diesel plants throughout the country. From an engineering viewpoint, it represents the latest ideas in diesel power plant design. The building is 150½ feet long and 65 feet wide, with a clearance of 27 feet from the floor to the underside of the roof trusses. Under the entire building is a basement with a clear headroom of 12 feet.

Upon entering the building, one is impressed by the ample natural light. The window area is 6,500 square feet, the light coming from all four sides and from the monitor in the roof. The interior walls are painted white, which with the aluminum-painted steel work, piping and auxiliaries, aids in providing a well-lighted interior. Night illumination is provided by eighteen 450-watt mercury-vapor lamps with small lights on the side walls.

The exterior is of dark red brick laid in black mortar. The stone trim is of Carthage marble. With its setting in large forest trees, shrubbery, the wide expanse of lawn, winding driveways, fountains and fish pool, the exterior is in keeping with the interior. The tile roof, steel stairs, steel sash and doors provide fireproof construction throughout.

About the time construction work on the new building was started, arrangements were made for the purchase of a third diesel unit. This was a 1,250-hp. Nordberg engine of the same type as that purchased in 1923. By the time the new building was under roof, erection of the new engine was started. This went into actual service in 1928. With this unit under load, overhauling and removal of the old units was started. During the change-over period, it was necessary to keep both plants running to handle the load until both large units were in service in the new plant. It was, of course, very essential that there be no interruption of service during the change-over period. Early in 1931, all the generating and pumping equipment had been overhauled and removed and the necessary changes made in the distribution systems of electricity and water. The manner in which the work was carried on with a small force of men delayed it greatly. Much time could have been saved had a sufficient sum of money been available to expedite the work and permit putting a large number of men on the job.

In the design and arrangement of the new plant, special precautions were taken to provide the utmost in efficiency from the standpoints of cost of operation and plant handling. With diesel plants the auxiliaries play an important part. At Carthage much thought was given to the fuel and lubricating oil systems, the filtering and silencing of air, closed cooling-water system, together with a number of automatic devices, all of which materially tend to reduce costs and provide better and easier plant handling. In this respect, it is believed to be a model in design and layout.

Method of Financing

The manner in which the improvements of the old diesel plant and the building of the new were financed was somewhat out of the ordinary for municipalities. For such extensive improvements, bonds are generally voted and the improvements quickly made. At Carthage all the work was paid for from earnings. Since it was necessary to earn the money before making the improvements, much longer time was required to finish the job than would have been the case had ready funds been available.

Of the last bond issue, that for $100,000 in 1920, $65,000 has been recalled. With the $18,000 now in the sinking-fund, only $17,000 is the actual bonded indebtedness at the present time. The new diesel plant, including the building, equipment and other improvements, has a value of approximately $500,000, which has been obtained without any outside financing whatsoever and without a single cent of added expense to the taxpayers.

Plant Returning a Profit

An analysis of the plant performance record over a period of six years shows a steady growth in kilowatt-hours produced, with only a small increase in produc-

THE CARTHAGE PLANT EXTERIOR

SIX YEAR PERFORMANCE RECORD OF DIESEL POWER PLANT 1925 - 1930

YEAR	K.W. HOURS PRODUCED	PRODUCTION COST	DISTRIBUTION EXPENSE	GENERAL EXPENSE	TOTAL OPERATING EXPENSE	PRODUCTION COST PER K.W. HR. ON SWITCHBOARD	TOTAL PRODUCTION COST PER K.W. HR.	REVENUE FOR CURRENT SOLD	CREDIT FOR SERVICE TO OTHER CITY DEPARTMENTS	TOTAL REVENUE	PROFIT FROM OPERATION
1925	$4,044,370	$31,416.89	$5,738.19	$13,556.73	$50,711.81	$.00776	$.0125	$87,749.39	$25,099.42	$112,828.81	$62,117.00
1926	3,733,420	36,412.58	3,499.11	12,374.48	52,286.17	.00977	.0140	91,103.95	23,323.62	114,427.57	62,141.40
1927	4,146,327	36,218.40	3,796.39	13,068.55	53,080.54	.00873	.0129	97,938.98	20,785.53	118,724.51	65,643.97
1928	5,019,310	38,768.22	3,377.15	13,482.03	55,624.41	.00772	.0110	109,190.67	24,650.69	133,841.56	78,217.14
1929	5,696,870	36,990.42	4,543.96	15,180.68	56,715.06	.00649	.0098	128,643.31	27,035.63	155,678.94	98,963.88
1930	5,986,230	34,102.28	5,000.68	21,854.85	60,957.81	.0057	.0101	130,446.65	28,566.45	159,013.10	98,055.29
AVERAGES	4,771,088	35,650.46	4,325.95	14,919.46	54,895.87	.00747	.0115	107,512.19	24,906.89	132,419.08	77,523.21

DISTRIBUTION OF CURRENT PRODUCED

YEAR	K.W. HOURS PRODUCED	K.W. HOURS SOLD	% OF PRODUCED	K.W. HOURS WATER DEPT.	% OF PRODUCED	K.W. HOURS STREET LIGHT	% OF PRODUCED	K.W. HOURS PLANT AUX.	% OF PRODUCED	K.W. HOURS PLANT LIGHTS	% OF PRODUCED	K.W. HOURS FREE SERVICE	% OF PRODUCED	K.W. HOURS UNACCOUNTED FOR	% OF PRODUCED
1925	4,044,370	1,607,925	39.7	1,535,092	38	300,741	7.54	179,530	4.34	19,949	.49	27,500	.68	373,633	9.25
1926	3,733,420	1,634,291	43.8	994,883	26.7	280,600	7.5	173,322	4.64	25,940	.70	50,000	1.32	574,384	15.35
1927	4,146,327	1,811,660	43.7	1,266,003	30.6	290,710	7	192,310	4.63	28,985	.69	39,215	.92	517,444	12.46
1928	5,019,310	2,388,161	47.6	1,425,156	28.4	290,440	5.78	214,637	4.27	40,352	.86	109,978	2.19	550,586	10.9
1929	5,696,870	3,041,048	53.4	1,354,793	23.8	292,080	5.15	242,307	4.25	63,287	1.1	77,510	1.37	625,848	10.9
1930	5,986,230	3,097,645	51.7	1,366,754	22.9	314,234	5.26	272,816	4.56	69,565	1.17	102,465	1.71	762,751	12.7

THE PLANT'S PRODUCTION AND DISTRIBUTION RECORDS

tion cost. This has resulted in a better showing in regard to profits. Since the plant is now relieved of some of the extra operating expense incident to the construction period, an even better showing can be expected in the future.

It should also be noted from the tabulation that a considerable portion of the current produced is used by the various city departments for pumping, street and building lighting, sewage disposal, etc. Some years this amounted to 40 per cent of that generated. Although the electric department receives credit for these services, the rate on which this credit is based is practically the cost of production and much lower than could be obtained from an outside source. If based on a rate such as the city would have to pay, the plant would show a far greater profit. Current rates materially affect profits and some municipalities showing big profits have the benefit of high rates. The rates at Carthage have always been comparatively low; in fact, lower than in most cities of the same locality. On September 1, 1931, a new rate for domestic lighting went into effect, this being a reduction of 1c per kwh. upon the entire schedule. The following net rates are in effect:

DOMESTIC SERVICE

Lighting

First	25 kwh.	7c per kwh.
Next	50 "	6 "
Next	75 "	5 "
Next	100 "	4 "
All over	250 "	3 "
Minimum per month		50c "

Composite—Optional

100 kwh.....$5.00 All over..... 3c per kwh.
Minimum per month, $5.00.

Range Rate

First	50 kwh.	4c per kwh., less 1/4c discount.
All over	50 kwh.	3c per kwh., less 1/5c discount.

Minimum per month, $3.00.
Bill net—10 per cent penalty added for non-payment after 10th of month, on all rates.

All household electric appliances may be placed on the range circuit and take that rate.

RURAL SERVICE

First	25 kwh.	8c per kwh.
Next	50 "	7 "
Next	75 "	6 "
Next	100 "	5 "
All over	250 "	4 "
Minimum per month		50c "

Bill net—10 per cent penalty added for non-payment.

Power users are given two rates: a secondary service rate for those using transformed service and the commercial power rate for 2,300-volt untransformed service.

POWER SERVICE

Secondary Service

First	5,000 kwh.	1.6c per kwh.
Next	5,000 "	1.5 "
Next	5,000 "	1.25 "
Over	15,000 "	1 "

Commercial Power Service

First	5,000 kwh.	1.5c per kwh.
Next	5,000 "	1.3 "
Next	5,000 "	1.2 "
Next	10,000 "	1.0 "
All over	25,000 "	.9 "

Reasons for Success at Carthage

What has been accomplished at Carthage is possible with any municipality, providing its utilities are properly managed and modern equipment provided. The utilities at Carthage are under a Board of Public Works consisting of four members. During the 33 years that this Board has served the city, but few changes have been made in its personnel. Service to the city has often been given at the sacrifice of private business. Neither personal favor nor political influence has ever been allowed to interfere with the functioning of this Board. Too often failure of public ownership can be traced to lack of proper management.

Another factor for success at Carthage is the excellent supervision and high quality of the operating personnel. The municipal power plant should be one of the show places of any city. There are many cases, however, where the untidy appearance and uninviting surroundings are not attractive to visitors. It is not a difficult task, neither is it a wasted expenditure, to keep the power plant, its equipment and grounds clean and inviting. When once placed in proper condition and with a staff properly trained, it is easy to keep it in that condition.

At Carthage a policy has been adopted of paying a fair wage to all employees. Men who are underpaid and incompetent cannot be expected to properly care for the equipment, nor will they be vitally concerned in the plant's making a successful showing. Visitors at the Carthage plant are invariably impressed by the courteous treatment received and the general appearance of the building and grounds.

Carthage, too, was fortunate in having in the employ of the city an organization capable of handling all matters incident to building the new power plant. This has allowed the city to secure a building of better construction exactly suited to the city's requirements and at a saving in cost. That the electric department was permitted to carry through the various ideas with full cooperation of the Board was also a material aid.

That Carthage today supplies its own power and light requirements is due to the change to a more efficient type of power unit. Beyond all doubt, if a change had not been made from steam to diesel, the plant would have passed into other hands long ago. These modern power units changed it from a losing to a profitable venture. It is now a valuable asset to the city.

Lower Taxes? Or More Service to the Public?

A GREAT deal is said at this time about paternalism in government. The times have changed—the demands on government have been increased to such an extent that our problems increase from day to day, but who is responsible for this? What were, in times past, private responsibilities are now public responsibilities. Where must it stop? When and how must we stop it? The average citizen today is demanding more service and less taxes. It is the duty of the public official to study the needs and supply them in a manner that will be in keeping with the ability of the citizens to pay. . . .

A great amount of discontent among taxpayers is engendered by comparative figures over a period of years showing the increase in outlays in our cities without showing a comparison of increased service demanded and furnished. Outside of the local demand for increased service and necessary outlay, it can be shown that a large increase in local taxation is due to standards set and mandatory regulations imposed by larger political units.

The great progress made during the past few decades in health, sanitation, education, transportation and social subjects has naturally increased the tax burden on all the political units of the country, but the sad feature is that instead of setting up the additional safety, comfort and service against the additional dollar, public officials have been defending the expenditures of their particular units by pointing the finger of scorn and censure at the next smaller unit. The city, being at the small end of the scale, receives the accumulated criticism of those above, and the citizen is constantly being educated to the idea that his particular bailiwick is the poorest government on earth. . . .

Some recognition must be given to the fact that the Federal and state governments are very remote to the touch of the average citizen, but his local government is before him daily with its needs, etc., and when the Federal and state governments assist him in creating demands and at the same time tell him that his local government is spending too much money, two things occur with the same result: he doesn't have his demands met and is dissatisfied; or the demands are met, with a resultant increase in taxes, and he is again dissatisfied.

This condition, of course, only makes the citizen interested in his local government from one standpoint—that of censure or destructive criticism. It puts the local official always on the defense against his own people when he and they should be cooperating as aggressors in a common cause.

—From an address on "Interesting the Taxpayer in His Government," by Frank C. Hanrahan, City Manager, Portsmouth, Va., at the Institute of Public Affairs, University of Virginia, July 1, 1931.

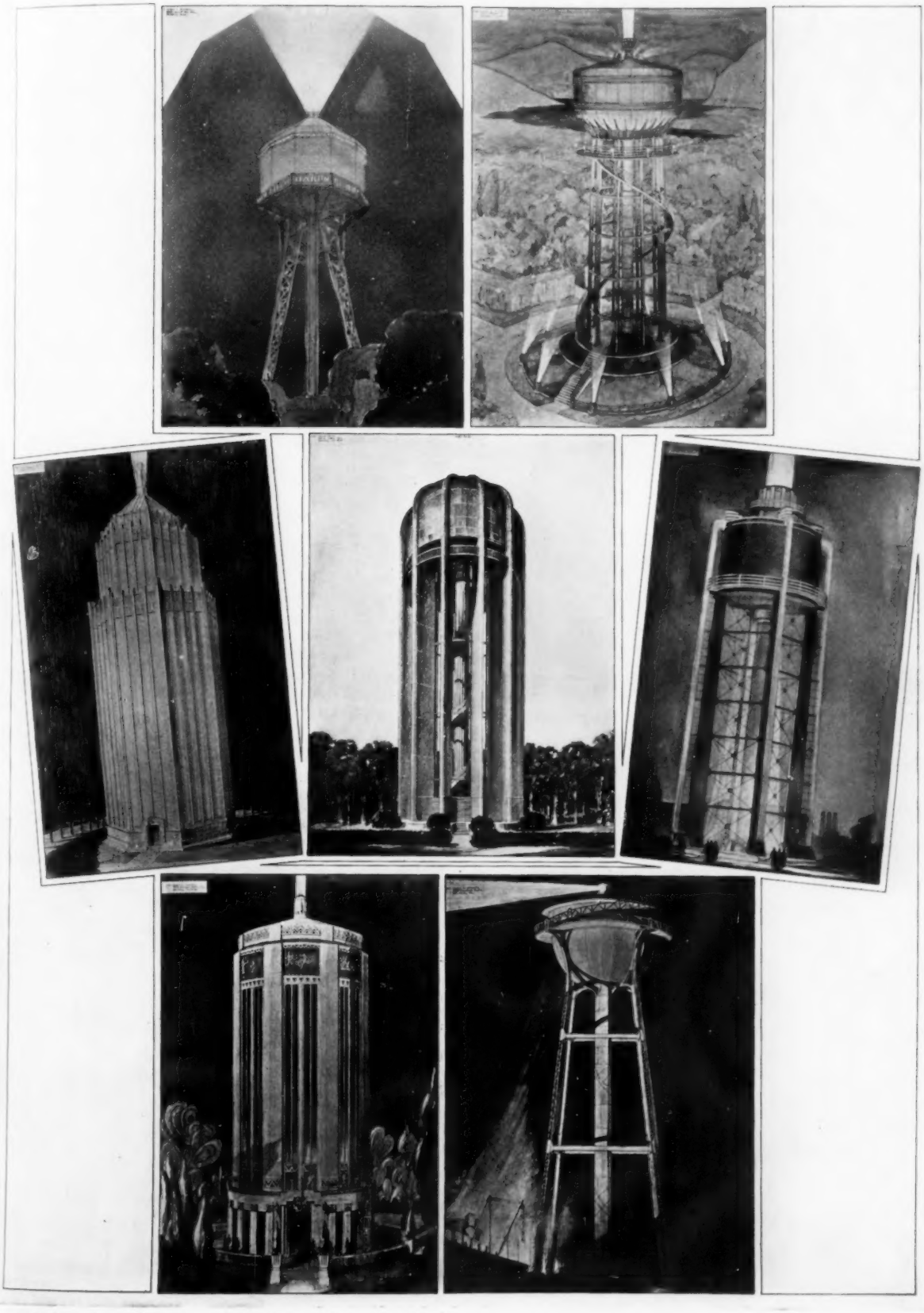
The Aviation Influence in Water-Tank Design

As Exhibited in Competition for Esthetic Improvement

THE international competition for design for modern elevated water tanks sponsored by the Chicago Bridge and Iron Works, Chicago, Ill., closed late last spring. In examining the set of 152 designs offered in this competition, it has been most interesting to note the tendency of the designers to make the elevated tanks practical from the standpoint of the Water Works Department, and artistic so as to be a definite addition to the civic architecture of the community, and also through the elevated structure to serve aviation. On the following page are reproduced a number of designs that fill these three requirements. The central illustration, by Eugene Boita, won the first prize in the competition but did not include an air beacon in its design. This might easily be added, however, and would not detract in any way from the excellence of the design which was selected by the judges for the major award.

The problem presented to the competitors includes these conditions: the tank shall contain 200,000 gallons, or approximately 26,700 cubic feet, and the top of the tank shall be not more than 110 feet above the ground level, and the low-water line or bottom of the tank not less than 85 feet above the ground level; the water connections or standpipe from the tank to the ground shall be at least 5 feet in diameter, which is the size necessary to prevent freezing; all portions of the tank and structure must be built entirely of structural steel, and it must not contain metal work nor sheet metal the nature of which may be perishable or short-lived as a result of its design or of the frailty of its mass.

Water-Tank Designs with Air Beacons



From the International Competition of the Chicago Bridge and Iron Works

Cost of Truck Operation on County Highway Work

By **AL P. ERICKSON**
County Auditor,
Hennepin County, Minneapolis, Minn.

ONLY four county trucks hauled gravel on the highway projects authorized and completed in Hennepin County, Minn., in 1930, owing to the fact that the county had been obliged to scrap, or was not able to use, a number of the trucks received when the Federal Government had distributed its war stock. The total quantity of gravel hauled with county trucks amounted to only 15,888.52 yard-miles, as compared with 253,088.23 yard-miles hauled by hired trucks on a yard-mile basis. It is interesting to note that the yard-mile cost for hauling with county trucks was reduced from 25.1 cents in 1929 to 12.5 cents in 1930. This represents a saving of approximately $2,000, even on the limited amount of yard-mileage hauled by county trucks in 1930.

COUNTY REPAIR SHOP AND PART OF THE COUNTY ROAD EQUIPMENT

The average for all jobs on which county trucks were used was 12.5 cents but there were jobs where the hauling was as low as 8 cents. On the other hand, there were two jobs which cost 32.2 and 49.1 cents, respectively. The average haul on these two high-cost jobs, however, was 1 and 1.19 miles, respectively, while the low cost of 8 cents was made on a 7.5-mile average haul. The length of haul has a definite effect upon cost. The average for county trucks in 1930 was 4.92 miles, as compared with 2.19 miles in 1929. Undoubtedly this longer average haul partially explains the increase in performance from 9.34 yard-miles per hour in 1929 to 17.5 miles per hour in 1930. Whether or not the longer haul entirely explains the increase in yard-miles per hour and the lower yard-mile cost in 1930, may be debatable. It is probably true that better truck and driver performance and lower operation and maintenance costs also had something to do with the lower yard-mile cost established in 1930.

Comparison Between New Trucks

It is interesting to note the comparison of performance and costs of the new Federal truck and the new Ford truck which were put into operation during 1930. The Ford truck put in 166.5 hours hauling 2,409.41 yard-miles, while the Federal put in 496 hours hauling 9,531.2 yard-miles. The Ford truck averaged 14.47 yard-miles per hour, while the Federal truck averaged 19.22 yard-miles per hour. As to production, the Federal, therefore, was considerably more effective, but when it comes to cost, both trucks hauled a yard-mile for approximately 11 cents. This figure is arrived at on a basis of 70 cents per hour for all operation, maintenance and depreciation charges for the Ford truck and $1.20 per hour for all operation, maintenance and depreciation charges for the Federal truck. These hourly rates are based on previous experience averages. The greater capacity of the Federal was probably offset by the greater speed of the Ford.

Hauling Gravel with Hired Trucks

Hired trucks were paid 14, 15 and 16 cents per yard-mile for hauling gravel on various jobs during 1930, the average being 15 cents as compared with 15.1 cents in 1929.

Owing to the fact that the county had but few trucks that could be used for gravel hauling in 1930, the hired trucks hauled 253,088.23 yard-miles during the year as compared with 28,888.30 yard-miles in 1929. In 1929, the average length of haul was 3.83 miles, as compared with 4.25 miles in 1930.

The average cost of 15 cents for hired trucks in 1930 is 2.5 cents higher than the average cost with county trucks. This difference in cost amounts to $6,327 on the 253,088.23 yard-miles handled by the hired trucks during the year.

The hired trucks averaged 19.67 yard-miles per hour. This average was established on 16 jobs, totaling 222,584.81 yard-miles, for which the hours put in by hired trucks hauling gravel were available. The maximum yard-miles per hour on any job was 24.40, with an 8.40-mile average haul, while the lowest number of yard-miles per hour on any one job was 7.89, with an average haul of 1.06 miles.

HENNEPIN COUNTY TRUCKS HAULING FROM A GRAVEL PIT

Figured at the rates paid per yard-mile, this indicates that the hired trucks earned on an average $2.77 per hour for each hour worked on these 16 jobs. The highest amount paid on any one job was $3.42 per hour, while the lowest was $1.26. On only two of these 16 jobs did the earnings of hired trucks fall under $2, while 11 of them show earnings of more than $2.50 per hour for each hour worked.

Truck Maintenance

The foregoing comments refer only to trucks used for gravel hauling, so that it may be well to call attention to the cost of operation of all county trucks. The cost per hour shows that the total cost decreased continuously from 1925 to 1928, inclusive, but there was an increase from $1.05 in 1928 to $1.26 in 1930. The biggest single factor in this increase was depreciation amounting to 39 cents per hour. This depreciation increase is explained by the fact that the county had recently bought new trucks upon which depreciation was being charged, while no depreciation was charged against the old war-stock trucks.

There has been a reduction in repair costs due to the larger number of compartively new trucks, on which repairs would naturally be limited. The gasoline cost showed a decrease of approximately 10 cents per hour, which is due to the fact that the county purchased gasoline cheaper and also because the consumption decreased from 2.25 gallons to 1.91 gallons per hour.

Cost of Tractor Operation

The average hourly cost for maintenance and operation of tractors in 1930 showed a decrease from $2.22 per hour in 1929 to $1.96 per hour in 1930. This is the lowest hourly rate established since 1925.

A reduction of approximately 11 cents for repairs, and approximately 13 cents for gasoline, per hour are the primary reasons for the change in the hourly cost as compared with 1929. The reduction in gasoline cost was due to lower gasoline prices and a reduction in consumption from 3.84 gallons in 1929 to 3.61 gallons per hour in 1930.

AN ELEVATING GRADER OUTFIT, WITH TANKS FOR HAULING

Operation of Heavy Power Maintainers

The 1930 average per hour cost of operation of heavy power maintainers was $1.15, representing a decrease of 7 cents per hour from the 1929 record of $1.22. This net decrease was made up of a total of 10 cents decrease, which was divided between 8 cents for repairs and 2 cents for gasoline, and a 2-cent increase in depreciation and a 1-cent increase in other items.

Data on Patrol Graders

The average hourly rate for patrol graders was 15.4 cents in 1930, as compared with 18.5 cents in 1929. This reduction is due entirely to the reduction in repair costs from 16.2 cents in 1929 to 13.0 in 1930, the average for a 6-year period being 12.3 cents. The total number of hours used in 1930 was 20,915, as compared with 21,657 in 1929. The total cost in 1930 was $2,715, as compared with $3,520 in 1929.

To Frank R. Chailquist, chief accountant of the County Auditor's office, is due full credit for the completeness of the report from which this article was prepared. He has spared neither time nor labor in analyzing every detail of the work in connection with the road and bridge construction by the County Board.

Buying a Road or Street— A Broad View of a Common Problem

By **RODMAN WILEY**
Vice-President and Sales Manager,
Kentucky Rock Asphalt Company,
Louisville, Ky.

I AM writing this from the standpoint of a former head of a "one-man" State Highway Department, a member of a firm of successful contractors, a rock asphalt salesman, and a taxpayer. It seems to me that I have had sufficient experience to view the purchase of a road or street from all angles. I am frank to say that my experience justifies the conclusion that a man acting solely on the experience gained in any one of the above capacities is likely to have a warped judgment; that training, experience, and public opinion, largely molded by the press, are likely to affect a man's judgment to such an extent that he cannot be wholly unbiased in his decisions.

The actual buying of a road or street has so many angles, many of them technical, that the public is not, as a rule, informed in such matters. There is, however, really nothing peculiar about the buying of a road or street, but, inasmuch as it is usually done through the agency of public officials, the taxpaying public is generally ready to believe that money for road and street purposes is not properly expended. Sometimes laws are enacted requiring officials to advertise for bids on two or more types of paving, with the expectation that competition between materials will result and the public will therefore be protected.

When Competition Is Not Actual Competition

There is a clamor on the part of the public for competition although, generally speaking, the average man does not know what it means or how to get it. It is believed that advertising for three or four types of road materials will result in competition. Such is far from the truth. In the first place, there can be no "real" competition between types, because it is impossible to so design several types that each will cost the same amount of money, without detracting from the durability or wearing quality of some of the types. To illustrate: it is practically impossible to design a road calling for a brick wearing surface on a concrete base to compete in price with a cement-concrete road.

Suppose that bids are asked on the usual design for three types: a cement-concrete road, a brick wearing surface on a concrete base, and an asphalt wearing surface on a macadam base. The engineers can figure with a great deal of accuracy the bids that can reasonably be expected on each type, and if it is the policy to accept the low bid, the engineers' figures then and there decide which will be bought. It is just a question of who is the low bidder on that type.

If officials want to build any particular type of road and the law requires that bids be taken on more than one type, all that has to be done is to include types that will be bid higher than the one wanted.

A Case Where Alleged Competition May Boost the Price

The plan of advertising for more than one type might result in paying more for the cheapest type than it is worth. For example, we will say that asphalt on a concrete base figures at $25,000 per mile, and brick on a concrete base, $35,000 per mile. There may be only one or two bidders, and if it is the policy of the officials to accept the lowest bid, contractors can boost the price on asphalt $5,000 or $6,000 per mile and still be under the price bid for the brick.

So, in practice, it seems to me that the best values will be obtained and criticism will be averted if officials will select one type for each project and take bids only on that type. Every contractor who bids on the work will know that if he is reputable and is low bidder he will get the work.

A railroad company does not take bids for a brick, frame or concrete building. It selects what it wants and builds it. A man does not advertise for three or four

types of material for a dwelling. He decides on what he wants and calls for bids on it. Why should we depart from such practice when it comes to buying a road or street?

If the law compels that bids be taken on more than one type, then, in my opinion, the engineers should make a proper design for each type; carefully figure what each type is worth in each particular locality; and award the contract in line with the best bid offered for the various types—not necessarily the low bid, but what represents true value. It might be the highest bid.

When contractors are bidding on more than one type, naturally they figure that there is a strong chance for "fine promotion work" on the part of salesmen; and it is possible for a well-thought-out plan of salesmanship and publicity to so sway public opinion that a type is bought which does not represent real value.

Select the Type—Then Ask for Bids

I contend that the only way to have real competition, and to allow highway officials to do their duty without being unjustly criticised, is to select one type of material, take bids on it and award the contract to the lowest responsible bidder. By this I do not necessarily mean that the same type should be selected for all the road work in a state or city, but that the type selected should be the best suited for the locality and the needs of traffic. In this way there will be active competition among the dealers supplying the material for that particular road, and purchasers will be assured the best materials at the lowest price.

The Pittsburgh Fire School Lessens Fire Costs

PITTSBURGH firemen are being constantly trained for greater efficiency in fire fighting, salvage and life-saving activities through the operation of the Pittsburgh Fire School in Neville Street. The activities of the school are supervised by a board of directors which includes Director James M. Clark of the Department of Public Safety, two deputy chiefs, sixteen battalion chiefs and the writer. Captains Hugh Hunter and A. K. Foster are the instructors in charge.

The school operates continuously throughout the year. It is housed in a special six-story building, in the East End District. The personnel of all the regular companies in the city take training periodically. Class membership is limited to fifteen men, and the course lasts for fifteen working days.

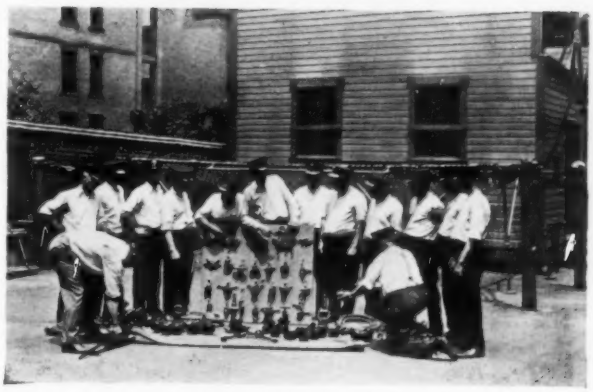
During inclement weather, special indoor activities are arranged. These include salvage operations, such as efficient methods for covering furniture, merchandise, machinery, etc., for which proper protective equipment and working material are provided. Other activities include instruction in knots and hitches, first aid and resuscitation, fire-alarm signals, connections, the naming of tools and appliances, a thorough understanding of wet and dry sprinkling systems, etc.

The outdoor activities include seventeen evolutions of different connections with fire hose and appliances, the timing of each evolution to speed up the work, use of scaling ladders, including the raising and lowering of different style ladders, holding and jumping in life-nets and shooting of life-lines.

In addition to the regular personnel of the Department, substitutes or probationary men are also required to take the course. These men are taught elementary principles, such as connecting lines, raising and lowering ladders, use of life-belts, sliding down rope, and taking others down from windows.

Life-saving activities receive an unusual amount of attention. The Department is equipped with Burrell All-Service gas masks, McCaa oxygen breathing apparatus, H-H inhalators, waterproof first aid kits and many additional safety appliances. The Pittsburgh Fire Department are great believers and users of safety appliances for efficient fire fighting and rescue. The men use masks at every opportunity in an effort to get at the seat of a fire, for prompt attack and also for rescue.

Recently, through the courtesy of the Mine Safety Appliances Co., of Pittsburgh, approximately 250 fire captains, as well as all the deputy and battalion chiefs, took special gas chamber tests in one of this company's laboratories. These men wore masks and oxygen breathing apparatus and stayed in the poisonous gas for upwards of twenty minutes at a time. The chamber contained 1.6 per cent carbon monoxide gas, which would have been fatal in a few minutes without proper and adequate protection. The purpose of this test was to train the men in the use of respiratory protective equipment and to give them confidence in the equipment.



CLASS DEMONSTRATIONS
Above, a life-saving demonstration; below, a discussion of hose connection techniques

RICHARD LEE SMITH,
Chief, Fire Department, Pittsburgh, Pa.

The Advantages of the Ammonia-Chlorine Treatment of Water

By DR. J. F. T. BERLINER
and ARTHUR E. HOWE

THE use of ammonia and chlorine for water treatment is growing rapidly. A litttle over a year ago there were only five groups continuously employing this treatment; today more than 200 are applying it, and the number is rapidly increasing. Apparently the combination of these two substances constitutes not only an effective sterilizing agent for drinking and swimming water, but serves also as an effective means of eliminating many tastes and odors. Medicinal and chlorinous tastes, as well as the irritant action of the chlorine in swimming pools, are absent when pre-ammoniation of the water is practiced.

The ammonia-chlorine treatment also indicates a possible application in preventing algae and slime growths not only in swimming pools and city water mains, but in industrial water supplies such as condenser waters for power plants. The prevention of the slime coating of surfaces exposed to cooling waters allows the condenser to operate at improved efficiency for a longer period of time and reduces the frequency of shut-downs for cleaning.

Formation of the Compound

When a very dilute solution of ammonia is treated with chlorine, compounds known as chloramines are formed. There are 3 chloramines, but under the usual conditions encountered in the treatment of water supplies, only two are formed, the monochloramine (NH_2Cl) and the dichloramine ($NHCl_2$). The proportions of these two compounds in a given water depend, no doubt, on several conditions, but principally on the hydrogen ion concentration of the water. The more alkaline the water, the greater the amount of monochloramine. In the waters usually encountered for treatment, the hydrogen ion concentration is such that the monochloramine predominates. As far as is known today, these two chloramines have the same or very nearly the same bactericidal effectiveness, so the monochloramine and the dichloramine are referred to collectively as chloramine.

Water treated by the ammonia-chlorine treatment exhibits a high residual bactericidal efficiency over a long period of time under relatively adverse conditions. The sterilizing action is probably identical with that of chlorine, provided thorough mixing of the ammonia in the water has been accomplished.

Physical and Chemical Properties of Chloramine

The solubility of chloramine in water is considered to be of the order of that of ammonia. This high solubility is responsible for its excellent diffusion characteristics. Chloramine is very stable, much more so than free or active chlorine. A solution of chloramine may be subjected to heat, in fact to distillation, without much change in the concentration of the chloramine present.

It has been demonstrated that chloramine solutions retain their bactericidal effectiveness when exposed to the direct rays of the sun. This is of especial importance in swimming pools and in open reservoirs. It is in marked contrast to the behavior of chlorine under similar conditions.

Chlorine is a strong oxidizing agent. Therefore, when water containing reducible material, such as organic matter, is chlorinated, considerable chlorine is rapidly consumed by the reducible matter. This interferes with the desired action of the chlorine on the bacteria. Chloramine is an extremely weak oxidizing agent. In its reactions it is practically "neutral" as regards oxidation and reduction. When a water containing considerable reducible matter is treated with ammonia and chlorine, an effective residual is quickly attained with a relatively small amount of chlorine. Also, the amount of chlorine required has no relation to the oxygen demand (b.o.d.) of the water. The oxygen demand of a water may be considered as a measure of the reducible material present and as an indication of the amount of chlorine required when ammonia is not being employed.

The efficiency of chloramine in the presence of considerable organic matter, combined with its relative stability, accounts in part for the ease with which chlorine residu-

—From a paper delivered at the Fourth Annual Conference, Pennsylvania Water Works Operators' Association.

Sterilization with Chloramine

The ammonia-chlorine process is an efficient, effective and simple means of treating many types of municipal and industrial waters. By using it, many difficulties such as tastes, odors, after-growths, algal growths and high chlorine demands can in most instances be completely or in part eliminated. While the process has been known for a long time, its general adoption has been very recent and the fact that it has developed so remarkably within the past twelve months attests its applicability and effectiveness. It has now passed out of the experimental stage and is a well-established and reliable process. Through the accumulation of accurate information from control conditions, the process is every day becoming more definitely known and appreciated.

als are maintained under considerable periods of time and also accounts for the effective action of the ammonia-chlorine treatment in the suppression and elimination of aftergrowths.

Bactericidal Properties

A number of investigators had observed that the presence of ammonia or amino bodies in the water increased the bactericidal effectiveness of chlorine. For some time this could not be explained. Eventually the formation of chloramine was recognized and it was demonstrated that under certain conditions it had from three to six times the bactericidal effectiveness of chlorine.

Rideal has shown that chlorine gas has a phenol coefficient of 2.18 and that when ammonia is introduced, the coefficient is raised to 6.36. Since ammonia has practically no bactericidal action of its own, an entirely new and different compound must be created. The chloramine formed may have a higher solubility than chlorine in the cells of the bacteria and thus exert a more potent effect.

The ammonia-chlorine treatment appears to have a very effective action on algae and slime growths. This has been specifically advantageous in water supplies troubled with after-growths, especially of the iron bacteria and silicious groups. Municipalities with systems that have numerous dead ends have employed the ammonia-chlorine treatment with very effective results.

When studying the relative action of chlorine and chloramine on Cyclops, it has been observed that chlorine in concentrations of 8.0 p.p.m. did not kill the organism in two hours, although 20 to 22 p.p.m. were lethal in two but not in one hour. Chloramine in a concentration of 2.9 p.p.m. was lethal in 75 minutes, while in a concentration of 9.5 p.p.m. no organism survived a 10-minute exposure.

Effect on Tastes and Odors

Soon after the bactericidal effectiveness of the chloramine treatment began to be recognized, its effect on tastes and odors was noted. It had been found that numerous types of tastes and odors in water can be eliminated or suppressed or at any rate ameliorated by this treatment. The ammonia-chlorine process is not, however, a cure-all for taste difficulties. There have been quite a few instances where no beneficial effects were noted from it, but in most cases where medicinal, iodoform, chlorinous or phenolic tastes have been reported, chloramine has been found to be exceptionally effective. This has been of especial value in swimming pools for the elimination of the undesirable chlorinous tastes and odors that are irritating and disagreeable, while at the same time a high effective residual can be maintained under very adverse conditions.

In waters containing phenolic bodies, the disagreeable tastes are usually developed on chlorination. If ammonia be introduced prior to chlorine, the phenolic or chlorphenolic tastes do not develop, providing proper dissemination of the ammonia has been attained.

One factor to be borne in mind in the use of ammonia for taste and odor control is that it is essential that the ammonia be introduced *prior* to chlorination. For better sterilization, while it does not appear to be so imperative that the water be pre-ammoniated, the evidence indicates that better results are obtained by this system.

Application of Ammonia-Chlorine to Water

Anhydrous ammonia gas is introduced into the water supply in a manner analogous to that employed with chlorine. In place of a chlorinator, an ammoniator is employed. There is no particular technique or skill required to apply the treatment and one familiar with the handling of chlorine is fully qualified to control the ammonia-chlorine process.

The most important point in the installation of the ammonia-chlorine treatment is that of choosing the point of introduction of the ammonia. It is essential that it be introduced at a point that will insure complete and homogeneous mixing before the water reaches the point at which the chlorine is introduced. The point of application of the ammonia should, however, not be so far from where the chlorine is to be introduced that the ammonia will be consumed or dissipated through its utilization by living micro-organisms. It must be remembered that ammonia in itself has no bactericidal action and is an excellent nutrient for many types of organisms. The optimum point of application and the optimum distance between the ammonia and chlorine inlets are best determined by actual trial.

The actual dosages of ammonia and of chlorine that should be employed and the ratio of ammonia to chlorine cannot be generally stated. They can best be determined under the particular working conditions in which they are to be applied. A survey of the operating conditions of the numerous installations of the ammonia-chlorine treatment throughout the country reveals that the average ratio of ammonia to chlorine now being employed is about 2:3. In swimming pools and in waters subject to secondary infection a ratio of 1:1 has in many instances been found to be very effective.

Control of the Treatment

Controlability is an essential of any process of water treatment. An operator must at any time be able to quickly and accurately gage the effectiveness of the treatment being applied.

While the goal of any treatment is to maintain a bacteria-free water, and an actual bacterial count will be a measure of the efficiency of the treatment, this method is too tedious and requires facilities and considerable technique and experience for accurate and dependable results. It is known that if chlorine is added and the chlorine residual of the water is maintained sufficiently high, a measure of the sterility of the water is obtained by determining this residual. The established method of determining the residual chlorine is the now well-known o-tolidine test, which consists of adding a specified amount of the o-tolidine reagent to a specified amount of sample, and comparing the color developed with a series of calibrated color comparators.

It has been found that ammonia-chlorine treated water will also develop a yellow color when treated with the o-tolidine reagent and that the color developed for a given concentration of chloramine is identical with that produced by the equivalent amount of chlorine alone. This is very fortunate since the same apparatus and color standards may be employed. There is, however, one very distinct difference between the action of the o-tolidine

reagent on a chlorine and a chloramine solution. When the reagent is added to a water treated with chlorine alone, a yellow color develops immediately and in less than a minute attains its maximum coloration. In the case of water treated with ammonia-chlorine, the addition of the o-tolidine reagent results in a very slow development of color, requiring about fifteen or thirty minutes to attain its maximum depth corresponding with its true evaluation on the color standards. The rate of color development is dependent on the concentration and temperature conditions. In making the o-tolidine test on ammonia-chlorine treated water, it is necessary therefore to allow at least 20 minutes, and preferably somewhat longer, before comparisons with standards are made.

It is known that certain substances present in some waters effect the results obtained with the o-tolidine test. Among these substances, the one of particular concern when the ammonia-chlorine process is applied is the presence of nitrites. Fortunately, nitrites do not occur in most municipal waters, although they are present often in large amounts in the water of swimming pools.

Nitrites react with o-tolidine to develop colors comparable to those caused by chlorine. It can be readily seen that their presence would lead to erroneous results in the determination of chloramine by o-tolidine.

This difficulty is not encountered when chlorine is employed, as chlorine oxidizes nitrites at, of course, the expense of the effective chlorine. Chloramine is such a weak oxidizing agent that it reacts very slowly with the nitrites, and these two substances, nitrites and chloramine, may co-exist in the same solution. Because of this, it has become necessary to develop a modification of the usual o-tolidine test to be applied when nitrites are found to be present. This consists in merely taking advantage of the ease with which nitrites are oxidized and the resistance of chloramine against the action of mild oxidizing agents.

How Los Angeles Wages War on Its Rodent Population

A PERMANENT staff of seventeen men, including a director, assistants, trappers and laboratory technicians, is maintained by the Los Angeles City Health Department Rodent Control Bureau in its efforts to hold down the city's rodent population. As a result of this vigilance, between three and four thousand rats monthly are collected by the city's rat catchers and brought to the Health Department for examination. Figures for the year just ending are 46,464.

Each quarry is tagged according to the district in which it is bagged; each is examined in the health laboratory and indexed, so that in case a report of disease comes in from a certain locality, it can be traced and the section closed in by the health authorities.

Occasionally when there is a rodent migration, as was the case recently when Los Angeles rodents en masse moved from their ground location into the tall palms, greater effort is exerted to exterminate the pests than during normal conditions.

Confronted with the problem of chasing rodent tree sitters down from their lofty perch, C. K. Stewart, Director of the Rodent Control Bureau, found it necessary to devise a special ladder that would penetrate the center of the dense foliage in which the nesting rodents had established themselves, without breaking the brittle branches. With the aid of a three-way extension ladder, each extension being detachable and bolted to another, and the third so constructed that it spread over the branches and into the tree center without damage to the palm, the modern Pied Pipers set to work spraying the nests with barium carbonate. This mild poison in strong doses is used almost exclusively, instead of a more radical compound, as a precaution against infecting domestic animals.

When sufficient time had elapsed for the carbonate to take effect, city trappers made a haul of several thousand, picking them up at rodent concentration points. The Bureau has graphed and charted rodent maps of the city, and by this systematic policy, plus its index and examination records, it is able to carry on efficient work in rodent extermination.

Two men from the rodent control division are stationed permanently at Los Angeles harbor, where within the past year 2,553 ships were inspected. The new health ordinance makes it obligatory for all foreign and domestic steamships in and out of Los Angeles harbor to place rat guards on lines extending from vessels to docks or wharves.

As a feature of its war on rats, the Rodent Control Bureau maintains a permanent exhibit of ratproof food depots that meet the new ordinance requirements. Models show solid concrete floors with foundation walls extending 18 inches into the ground (the claim being that rodents will not burrow beyond 12 inches) and sealed to the floor, with no space whatever between floors and walls. Specifications for doors are that openings cannot be greater than ½-inch and clearances at top and bottom not more than ¼-inch. Open iron gates, common to most food markets before the new ordinance, are now condemned. As additional rat protection, the city demands that all openings in floor supports be sealed with metal lath or 14-gage, ½-inch ratproof wire. Wire mesh flashed up about a foot from the floor along the wall affords additional protection.

AN ARMED ATTACK ON THE TREE SITTERS

"Our aim," says Mr. Stewart, "is to wipe out nesting places and to cut off rodent food supply."

S. A. LEWIS.

Effect of the 1930 Drought on 1931 Water Supplies

Prepared from Official Sources and Annual Reports

ACCORDING to a standard dictionary, a drought is a "prolonged period of dry weather during which considerably less than normal rainfall occurs." For the twelve months between April 1, 1930, and April 1, 1931, there was a great shortage in rainfall. The United States Weather Bureau Records at Columbus, Ohio, indicated that during the first three months of 1931, taken as a whole, the rainfall was only about half of normal for that period. The year 1930 was by far the driest on record in the Ohio region, in spite of the fact that the drought did not begin until April.

Water supplies are dependent upon rainfall whether they be taken from surface streams, lakes or deep wells. The surface supplies, of course, reflect the rainfall in a much more pronounced manner, because rainfall and run-off are very closely associated, while underground waters, such as wells, represent the natural storage of water that has percolated down through the soil.

Surface Supplies

Surface water supplies are the first to feel the effects of drought and the first to feel the relief afforded by rains. So far as surface supplies are concerned, therefore, the drought is over as soon as a few heavy rains occur.

A study of every public water supply in the 39 counties of southern Ohio was made by the engineering division of the State Department of Health during January and February, 1931. In this area there are 115 public water supplies, 21 of which are obtained from surface sources and 94 from underground or well sources. Eight of the surface sources are procured from the Ohio River, leaving only 13 water supplies procuring water from smaller rivers and creeks, so that the effects of the drought were not so noticeable here, although the southern part of Ohio was more deficient in rainfall than the central and northern parts.

The eight cities and villages which take water from the Ohio River have known that there was a drought in spite of the fact there was sufficient water in the river to supply the pumps and piping systems. During the past year the river has been a succession of pools created by the Government navigation dams. The water was more or less stagnated and developed tastes which proved obnoxious to users. Efforts to remove the tastes were not entirely successful. The high water during April, however, swept away the stagnated water and restored the ability of the purification plants to furnish a safe, potable supply.

Some of the 13 cities and villages not on the Ohio River had to resort to extreme measures to supply water to meet ordinary demands. Cambridge pumped water from abandoned mines for several months, converting it into safe drinking water by purification. Blanchester exhausted practically all its stored water and was preparing to haul water by tank cars from the Little Miami River, 20 miles away, when light rains in January and February enabled the village to carry over until the heavy rains of April filled the reservoir. At Barnesville, the reservoir was depleted to within 2 inches of the bottom of the lowest pipe for drawing off water. Two miles of pipe line were laid to an adjacent watershed and some water, partly from abandoned mines and partly from run-off, was obtained and pumped against a lift of 300 feet. Positive relief was not afforded until the rains of April.

In areas not more than 20 miles from Norwalk, there were sufficient rains from time to time to keep the creeks supplied with a fairly good flow, but for some reason the area serving Norwalk's reservoirs was missed by most of the rainfall during the year of drought. In March permission was sought from the Department of Health to construct a pipe line 3 miles long to pump water from the Huron River into the Norwalk reservoirs. The flow in this river 3 miles away was nearly normal, although the run-off from the Norwalk watershed was practically nothing. The city is expecting to go forward with the pipe line, since there is no assurance that the Norwalk watershed will not be missed by future rains.

Ground Water Supplies

Ground water supplies are generally divided into two classifications, those which are secured from shallow sources down to 30- or 40-foot depths and those derived from deep sources. In Ohio, wells seldom exceed 300 feet in depth. The supplies from these shallow sources were the first to suffer during the fall and early winter of 1930.

Underground water may be said to be contained in vast reservoirs mainly in the sand and gravel strata. Overflows from these reservoirs that occur at the ground surface are known as springs. If water is drawn from this supply or if additional water from rainfall is not added, the ground water level recedes, causing springs to go dry and shallow wells to fail. If there is but little inflow from rainfall, the water level drops still further and trouble is experienced with the deeper well supplies.

The greater part of the rainfall of 1930 occurred during January, February and March, when conditions for replenishing the underground reservoirs were most favorable. As a result, the reservoirs, particularly the deep ones, were well filled and the drought conditions, extending into the fall and winter, had practically no effect on the yield of the deep wells. However, a survey conducted in February and March, 1931, revealed that the water level in a number of the deep wells was either stationary or slowly receding. The depths of water were still ample, giving no cause for immediate alarm, but the situation indicated the need for normal or greater rainfall throughout the spring and summer if a shortage is to be avoided in the late summer and fall.

To be most effective in replenishing these deep reservoirs the rainfall should be spread out instead of occurring at relatively short intervals. When floods occur, a good part of the rainfall runs away and does not contribute in a large measure to the replenishment of the deep underground water supplies.

Seals of Safety for Individual Wells

Several years ago the Department of Health of Ohio inaugurated a scheme of issuing seals of safety for wells which are privately owned but used by the public. The requirements for seals of safety are rigid as to location and development, to insure continued safety of the water. Almost all are drilled wells. In the area embraced by the 39 counties in southern Ohio, seals of safety have been issued for 60 wells, not one of which has failed in either quantity or quality. In many instances they have been used freely in the emergency by nearby residents whose supplies have failed.

Recognizing the need and value of such wells, the Department made an appeal to the Legislature for funds to drill 65 wells to be scattered through counties most seriously affected by drought and to be available for use by residents in these communities. The appeal was granted and $10,000 was appropriated for drilling.

Effect of the Drought in Louisville, Ky.

In the Louisville, Ky., district only 23.9 inches of rain fell, against a normal rainfall of 43.25 inches, making a deficiency for the year of 19.35 inches. For the seven months of April to October, inclusive, the total rainfall in this district amounted to 8.47 inches as compared to the normal of 23.97 inches. This makes a deficiency of 15.5 inches, or 65 per cent for the 7-month period.

This long drought period brought about the most extremely troublesome water conditions ever experienced in Louisville. Difficulties from high algae content, hardness, bad tastes and odors very seriously complicated operation of the plant. Phenol taste appeared late in December and this was handled fairly successfully with preammoniation. Following this a mouldy organic taste appeared which has withstood all treatment. This taste was prevalent all along the Ohio River from Pittsburgh to Cairo and apparently none of the plants on the river were able to remove it or reduce it perceptibly.

The Drought in the South

During the drought, the deficiency of water in the southern states was most pronounced in Maryland, West Virginia, Kentucky and portions of Virginia. North Carolina suffered severely in only a relatively small area in northern counties adjacent to Virginia.

Although rainfall for 1930 was in many places as low as, or lower than, ever before experienced, the streams in general did not reach new minimum levels. This was due to the fact that 1928 and 1929 were years of high rainfall and much water had percolated into the soil and was retained as ground water, which was slowly given up to the streams during the period of deficient rainfall. Only on the Roanoke River, with sources chiefly in Virginia, did the streamflow reach a new minimum level. The flow of the Yadkin, Cape Fear, Neuse and Tar Rivers became very low, but not so low as in 1925 and 1926, the previous minimum years of record.

In a period of 17 months from February, 1930, through June, 1931, there were only four months with more than normal rainfall. Rainfall for the first six months of 1931 for the state of North Carolina as a whole was 5.27 inches below normal, in addition to the deficiency of about 12 inches at the end of 1930. It is expected that this fall the state will have a streamflow drought due to the fact that ground water reserves which normally supply streamflow in the dry months of September and October were greatly depleted in 1930 and have not been replenished by heavy soaking rains in 1931.

According to data furnished by the U. S. Geological Survey and the U. S. Weather Bureau, the cumulative rainfall and streamflow in every major drainage basin in the state showed a greater deficiency on June 30, 1931, than on the same date in 1930. In general, streamflow deficiencies on June 30, 1931, were about the same in the Piedmont and eastern region as in September last year. In the west, streamflow deficiencies are very much greater than last year at the same time.

At the end of June, 1930, the Hiwassee River was over 8 per cent above normal in total flow to that date. This year it is 23 per cent below normal. The Yadkin River in June of last year had accumulated 8.4 per cent less flow than normal and this year the deficiency at the end of June was over 37 per cent.

For the eight months from November, 1929, to June, 1930, rainfall deficiency averaged 18.4 per cent and streamflow deficiency 9.1 per cent. This indicates how ground water was being used up to supply deficiency rainfall in making streamflow. For the eight months from November, 1930, to June, 1931, the rainfall deficiency was only slightly greater than last year, or about 20.5 per cent, but the streamflow deficiency was 34.2 per cent, indicating clearly that ground water no longer existed to appreciably maintain streamflow.

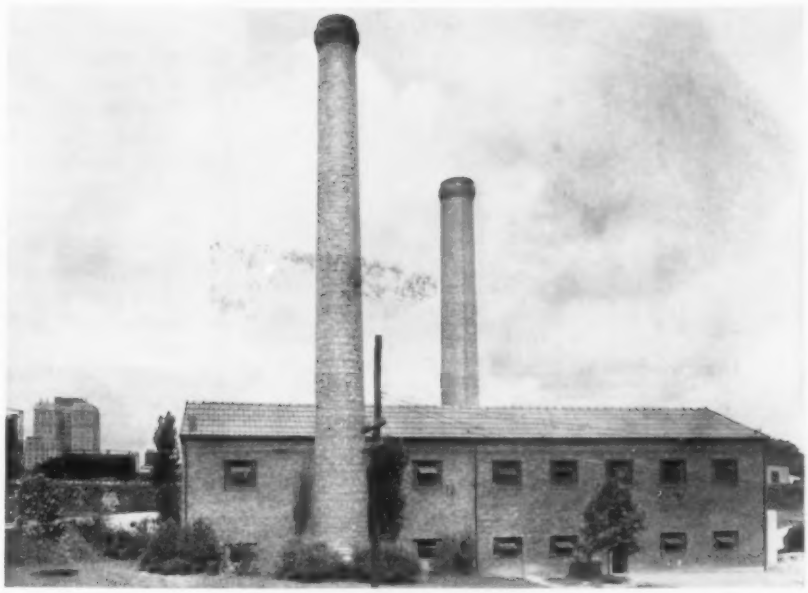
It is predicted that large areas of the state, and particularly the Piedmont region, will probably experience a very severe shortage in streamflow this fall which even normal rainfall during July and August will do little to relieve.

It has been recommended by the North Carolina Department of Conservation and Development that municipalities dependent upon run-of-river sources, and having should operate them with the utmost care even if they fill to overflowing in July and early August, as later streamflow will almost surely be markedly deficient. Municipalities dependent upon run-of-river sources and having limited or no storage, should give consideration to emergency measures, which may have to be taken this fall to produce an adequate water supply.

MUNICIPAL AIRPORTS INCREASE

THE number of municipal airports in the United States on July 15, 1931, according to a report prepared by the Aeronautics Branch of the Department of Commerce, was 577, while the number on July 15, 1930, was 502, an increase of 75 in the year thus having been attained. The number of commercial fields increased from 535 to 601, a gain of 66. "Intermediate" fields increased from 333 to 351, and auxiliary fields from 206 to 259. Army fields decreased in number from 60 to 57; navy fields from 14 to 12, and miscellaneous from 7 to 6. The total of all these classes of airports was 1,863 on July 15 of this year, an increase of 206.

Incinerator Capacities at Greensboro Keep Pace with City's Growth



THE NEW GREENSBORO INCINERATOR
Its location is within five blocks of the City Hall. The entrance ramp is shown at the left

By **L. E. DEMPSEY**
Superintendent of Sanitation

THE city of Greensboro, N. C., has a population of 53,500, and is located in the Piedmont section of North Carolina. During the past ten years it has had a phenomenal growth, which has necessitated the expansion from time to time of its facilities for the collection and disposal of garbage, rubbish and ashes, in order to provide adequate services.

Organization

The personnel of the Sanitary Department consists of one superintendent and one foreman, 19 men hauling garbage and trash, 8 men in the Street Cleaning Departmetn and 4 men working at the incinerator. We have 10 trucks hauling garbage, trash and ashes. These trucks are divided between the wards, one truck to each ward, and only two men on each truck. All the garbage, trash and burnable materials are hauled to the incinerator and burned, while the ashes and unburnable trash are hauled to the city's dump, about a mile outside the city.

The incinerator is located within four blocks of Jefferson Square, which is the center of the city, and three blocks from the King Cotton Hotel, which is a 13-story building. The city garage adjoins the incinerator site, which makes it convenient for the trucks. We work 10 hours a day, 5½ days a week, from 7 o'clock in the morning until 5:30 in the afternoon, with a 30-minute recess for lunch. On Saturdays we stop work at noon.

Budget and Statistics

The budget for the Sanitary Department for 1931 is $46,230.00. The 1930 budget totaled $42,167.69, distributed as follows:

SUMMARY OF EXPENSES, INCLUDING REPAIRS, GASOLINE, OIL AND SALARIES

	Totals	Cost per Capita
Hauling garbage	$21,570.50	$.40
Burning garbage	6,943.52	.14
Street cleaning	13,653.67	.26
Total	$42,167.69	$.80

SALARIES

Chief, Sanitary Department	$2,400.00
Men hauling trash (19)	15,310.00
Men cleaning streets (8)	8,155.00
Men working at incinerator (4)	5,205.00
Total (32 salaries)	$31,070.00

GARBAGE, TRASH AND ASHES HAULED TO INCINERATOR AND BURNED

	Loads	Tons
City-hauled garbage and trash	18,215	14,131
City-hauled ashes	9,709	6,243
Total hauled by city	27,924	20,374
Trash hauled by private trucks	6,074	3,037
Grand total	33,998	23,411

2,014 loads of ashes hauled from incinerator to dump
14 horses hauled to incinerator and burned
545 dogs hauled to incinerator and burned
Average cost per ton, burning garbage at incinerator, $36
Average cost per ton, hauling garbage and ashes, $1.07
Amount collected for hauling garbage and ashes, $4,413.10

STREET CLEANING

4,622 blocks swept by hand, residence section
2,656 blocks swept by hand, business section
7,007 blocks flushed, residence section
11,084 blocks flushed, business section
4,392 miles swept by Elgin sweeper No. 32
5,922 miles swept by Elgin sweeper No. 33

MISCELLANEOUS

306 storm sewers cleaned
1,947 complaints attended to

The Development of Disposal Methods

The city made no effort to dispose of its trash and garbage except by burning in the cemetery lot, until 1914. In that year a small open-top incinerator was purchased from the Nye Odorless Crematory Company, of Macon, Ga., and erected just north of Green Hill Cemetery. At this time also the first collections from the residential sec-

OUTGOING DRIVEWAY AT THE INCINERATOR
The municipal garage is seen at the extreme left

IN A RESIDENTIAL SECTION
A truck loaded and ready to drive to the incinerator

tions were begun. All forms of trash and garbage were collected, including dead animals.

By 1919 the department was sufficiently systematized that by starting Monday morning in the northern section of town, it was possible to complete the work by Saturday night. This method of weekly collection continued until 1922, when the Sanitary Department was organized.

The old incinerator was by this time outgrown, and was unable to burn the city's waste. This fact made it necessary to place a lot of the garbage on the dump unburned. Suits were threatened because of objectionable odors from the dump, so the city decided to build a larger incinerator. Property was purchased about two miles from Jefferson Square, east of the city, for the site of the new incinerator, which was of 20 tons capacity, estimated at the time to be sufficient to take care of the city's needs for ten years. One year after it was built, however, the city limits were extended, making the territory about sixteen square miles instead of four.

In spite of the large increase in area served, the incinerator was used until 1925. Then the city was again threatened with suits, because of its inability to burn all of the refuse collected, so a plant of forty tons capacity in twelve hours was decided upon. By this time the development of the incinerator had reached such a stage that by means of higher temperatures, more complete combustion could be obtained as well as the elimination of the odor, which had always made it objectionable in any locality. The City Council therefore chose a central location for a new-type rectangular plant, which was a Nye, just five blocks from Jefferson Square, on Percy Street. This plant and the East Market Street plant were used until this year, when it was determined to eliminate the long haul to the older site. It is estimated that over a period of years the saving resulting from the elimination of this long haul will pay for the cost of the additional unit which has been built. Before the last addition was built, an investigation and personal inspection was made of the various types of incinertors, after which an incinerator of one of the Nye circular type was purchased.

Collection Data

As records on the collection of garbage prior to 1922 are incomplete, it is only possible to make a comparison for the past eight years, but figures for this period reveal the startling fact that in 1922 the city hauled 3,900 tons of garbage and trash, whereas during 1930 the total of 14,131 tons was hauled.

Garbage and rubbish is now collected three days a week, Monday, Wednesday and Friday. Ashes are collected twice a week, Tuesday and Thursday.

The owner or tenant is required by law to provide metallic cans with close-fitting covers and with handles or bails. All garbage must be drained of moisture, and wrapped in paper. Cans containing water, ashes, or slops will not be emptied by the collector. All cans must be placed on the street convenient for the collector not later than 8:30 A. M. on the days collections are made. Cans so placed will be emptied free. If the collector must go on the lot, a charge of ten cents per can is made.

Salary Data for New York Municipalities

THE New York State Bureau of Municipal Information, Albany, N. Y., has recently issued several reports listing the salaries of various municipal officials in the cities of New York State, in effect in the middle of the current year.

Figures are given for city attorneys and corporation counsel in 57 cities, while in one city, Sherrill, compensation is reported as in fees only. The salaries range from $1,000 in Canandaigua (1930 population, 7,541) to $10,000 in Buffalo and Rochester, and $15,000 in New York City. The average from the 57 cities is $3,543.

Water works superintendents' salaries range from $1,500 in Canandaigua, where the superintendent of public works is also in charge of the water department, to $6,500 in Mt. Vernon and $12,000 in New York City. The average for 46 cities is $3,749.

For 22 cities figures are given for secretaries to mayors, the average being $2,395, and the range from $785 in Saratoga Springs to $5,000 in Syracuse (New York City not being included).

Daily compensation for election officials is given for 52 cities, the lowest figure being $4, in Middletown, and the highest, for primary elections, $15, in Yonkers; for registration, $12, in Elmira, Glen Cove, Mt. Vernon, New Rochelle, White Plains and Yonkers (with Port Jervis paying $10 for the first three days and $15 for the last day); and for election day, $15, in Elmira and New Rochelle. The averages are $8.53 for the primary, $8.26 for registration, and $9.76 for election day. Most of the cities report the payment of extra compensation for specific services.

Water Is Not Free—

But by Completing a Public Water System a Small Maryland Town Reduced Taxes

By **T. W. HACKER**
Associate of Whitman, Requardt and Smith, Consulting Engineers, Baltimore, Md.

IN keeping with the ever-increasing practice of furnishing townspeople with safe, potable water for domestic needs, many of the smaller towns and communities in the country are desirous of establishing public supplies, but are deterred from definite action by fear that the cost of such an undertaking will be excessive and constitute an undue tax burden on the people.

In the early stages of the settlement of a community, each house usually has a well or cistern which, once built, is considered to furnish "free water" to the house dwellers, no account being taken of the interest on the cost of the well or the other costs incident to the care and upkeep of the well, pump, etc.

This so-called "free water" becomes a false yardstick that mocks the cost of any public water supply, and not until the well runs dry or the water becomes polluted and sickness stalks the household can interest be aroused or thought directed toward a community supply which can be paid for by pledging the town property and which may be regulated and supervised by the state department of health or some other health-protecting body.

With a private well or cistern, the safeguarding of health by protecting the water source from contamination devolves upon the individual owner. As the community grows and population becomes more concentrated, problems of sanitation develop. Pollution of the water source becomes more imminent and protection more difficult.

Recognition of this fact, coupled with civic pride in keeping pace with modern progress and established custom in American cities, awakens agitation for a public supply, but it is frequently extremely difficult to convince the average citizen of a small community that the benefits to be derived are worth the outlay.

Agitation may continue for years through varying degrees of interest and apathy until through constant effort by the more enlightened and progressive element, sentiment becomes sufficiently crystallized to put through the necessary legislation and raise the needed funds.

As with most improvements, once installed and in operation for a time, the merits of a public supply prove themselves and wonder is expressed on all sides that it was ever possible to get along without it.

The Situation at Williamsport, Md.

Williamsport, Md., a town of some 1,775 people on the Potomac River about six miles from Hagerstown, Md., installed a public water supply in 1928. Prior to that time all water for domestic use was obtained from cisterns which were an adjunct of each house, or in several cases, from wells, but due to the fact that Williamsport is underlain with rock, well drilling is expensive and wells were few.

Some thirty years ago, according to the records of the town council, agitation was first started for a public water supply. Through the succeeding years the question would flare up occasionally but no definite action was taken until 1922 when a bill was passed in the Maryland legislature authorizing a bond issue of $100,000. The firm of Whitman, Requardt and Smith, of Baltimore, was retained to investigate and report on possible sources of water, feasibility and cost. Seven sources of supply were investigated, including the Potomac River, Little Conocheague Creek, springs, and the purchase of water from Hagerstown, which city at that time was contemplating the development of a Potomac River supply.

The purchase of water from Hagerstown proved to be a most economical source and a contract was entered into for water to be delivered from the new treatment plant on the Potomac River. Williamsport purchased the material for the water distribution system, such as cast iron pipe, meters, valves and fire hydrants, direct from the manufacturers, and bids were received from contractors for installing the material and constructing the system.

The system comprises some three miles of cast iron bell-and-spigot pipe mains ranging in size from 4 inches to 10 inches in diameter, with lead joints. In the house services, some 2½ miles of ¾-inch Reading galvanized wrought pipe were used. Twenty-four fire hydrants with two 2½-inch hose connections, five of which have steamer connections, were installed.

The system is 100 per cent metered and in all but a few cases meters are set in the sidewalk near the curb. Meters are owned by the town.

Costs

The cost of the engineering, materials and labor for the system was $50,848.12. Of this amount, engineering (including a report, contract plans and specifications for all material and workmanship) and supervision amounted to 11 per cent, materials 36 per cent, and labor 53 per cent, of the total cost. Itemized costs were as follows:

Mains in place—$1.80 per foot.
House service, complete with meter—$52.00 each (average).
Fire hydrants, set in place—$104.00 each.
The system, per house service—$104.00 each.

Water is purchased from Hagerstown at 13 cents per thousand gallons, measured by a master meter placed at the corporate limit of the town. Adjacent to the meter is a pressure reduction valve by which the normal pressure in Williamsport is maintained at some 30 pounds, but in time of fire can be increased to 130 pounds.

Savings Effected

At various times prior to the installation of the water system, cisterns ran dry and the town people were put to it to obtain water as best they could. In the second year following the installation, the record drought of 1930 occurred and, while again many wells and cisterns in the surrounding territory were dry, Williamsport was

enjoying a plentiful supply of water from the Potomac River. Fire insurance rates have been reduced 45 to 50 per cent, and, in addition, the town has passed from the stage of helpless despair during times of fire to that of greater security borne of having means for fighting fire. It is felt by the townspeople that already the value of property saved from destruction by fire has more than offset the cost of the system.

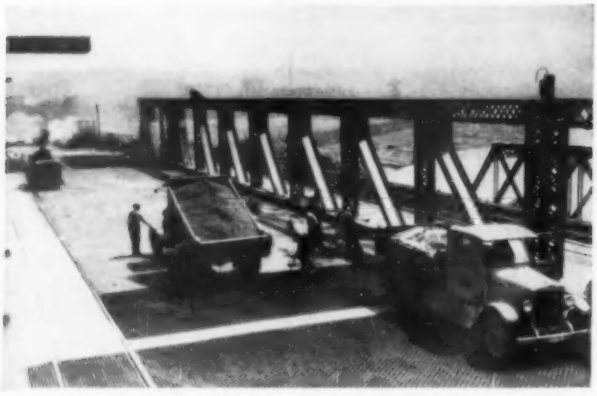
Increased plumbing facilities have been installed in a number of homes, adding to convenience and comfort and generally advancing the plane of living through the more liberal use of water.

Williamsport, which may be classed among the small towns of Maryland, after years of talking about a water supply now has one and has taken its place among the municipalities of more advanced and forward outlook. The supply has proved itself to be of immense benefit and, instead of constituting a financial burden, has enabled the town to reduce the tax rate from 45 to 40 cents per $100.00.

A Steel and Asphalt Bridge Pavement

A NEW engineering development in bridge floor paving was recently completed on the new West Spokane Street double-leaf bascule bridge at Seattle, Wash. Except for trial installations, it is believed to be the first application of its kind, and is thus of particular interest. Modern automobile traffic has brought the bridge floor-paving problem to the forefront, and engineers are faced with the problem of securing a light, smooth-rolling, non-skid surface which will retain these properties over a long period of years. Both asphalt and wood block pavements creep on bridge floors, and unprotected planking, which is desirable because of its light weight, is not satisfactory.

As the result of a comparative tryout on the University Avenue bridge in Seattle, a steel-mesh riveted pavement was chosen for the West Spokane Street Bridge. This steel pavement consists of a series of straight bars, 1¼ x 3/16 inches, riveted together with alternating reticuline or crimped bars, 1¼ x 3/16 inches, forming an open mesh mat. This was fabricated in sections and, by means of a uniquely designed interlocking splice, was assembled in the field to form a continuous pavement over the entire area. The splice was so designed that, when complete, a uniform pavement was secured with good traction and non-skid properties.



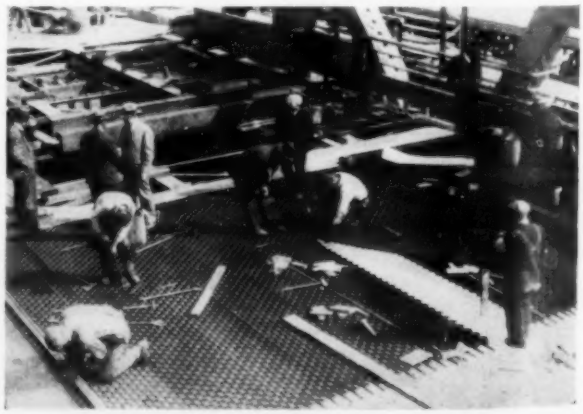
APPLYING AND ROLLING THE FILLER

The first illustration shows the installation of sections of the steel pavement on the bridge, indicating how they are readily attached together in the field. The steel mesh was fastened through clips, by means of 5/16 x 3-inch drive screws driven into the creosoted wood deck through a layer of galvanized sheet iron, which was introduced to protect the asphalt from any possible chemical action from the creosote.

The second illustration shows the completed pavement, which, as far as traffic is concerned, is satisfactory even if left open. If it were left open, it would collect dirt, which would retain moisture, become unsanitary and also hasten the corrosion of the steel. The pavement, therefore, was filled with sheet asphalt. The asphalt was spread and rolled uniformly, after which a heavy truck loaded with sand and equipped with wide, solid rubber tires was run back and forth while the asphalt was still warm, thus giving a slight cupping in the meshes which insures the good traction and non-skid quality of the steel pavement itself.

THE STEEL PAVEMENT COMPLETED
A view taken when the bridge was ready to have the sheet asphalt applied

The pavement is applicable to any type of bridge floor, whether wood, concrete or battledeck, and, when used, reduces maintenance and replacement costs over a period of many years. This installation was made under the specifications of the City Engineering Department and under the direct supervision of the Bridge Department of the city of Seattle. It was installed by the General Construction Company, Seattle, and made by the Irving Iron Works Co., Long Island City, N. Y.



INSTALLATION OF THE STEEL PAVEMENT

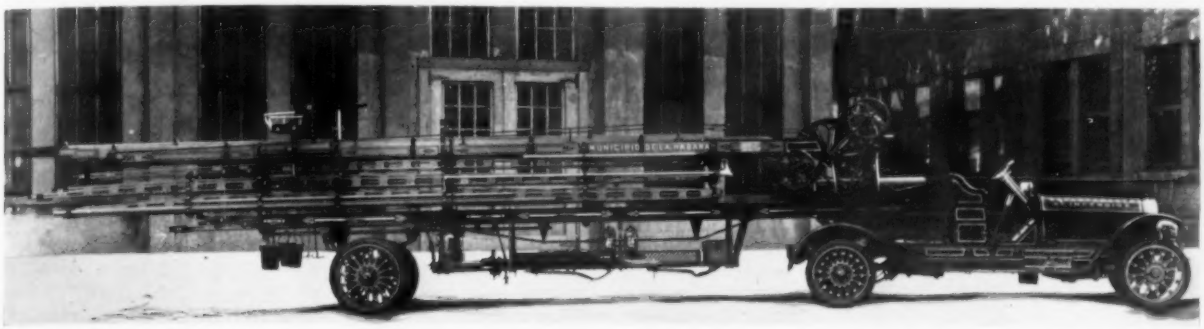
Havana's Modern Fire Department

And the Steps in Its Evolution

By COLONEL JOSÉ FERNANDEZ MAYATO
Fire Chief

In September, 1873, the first Corps of Firemen was formed in Havana with one station. Extinguishing apparatus consisted of one steam pump of English manufacture (Shand Mason), one hose reel and a few sections of hose. A battalion of government militia also assisted in extinguishing fires with hand pumps, but the two organizations functioned separately.

In 1883, a group of volunteer firemen, who had been dismissed from the first Corps, applied for permission to form a third organization. When their request was rejected by the authorities, they joined the government battalion and formed a company in charge of extinguishing fires. By that time the first Corps was equipped with three steam pumps and three hose reels. Two of these pumps were of English make and the third was an American Silsby pump. The Government Corps had two English pumps with corresponding hose reels. The number of stations, accordingly, had increased to four.



In 1902, the Military Government of Intervention under General Leonard Wood issued a military decree, merging the two Corps of Firemen, and calling the new formation "The Havana Firemen" ("Bomberos de la Habana"). By this time the property and equipment had shown a still further increase.

In 1916, the municipal government assumed control of the service as a city department, taking full charge of the maintenance of the Corps, which formerly had been financed by municipal subsidy, public subscription, and the fire insurance companies. The department consisted of 90 enlisted firemen and their officers. Leopoldo Freyre de Andrade, an engineer, was appointed Chief, and the writer (who had entered the Corps of Firemen in 1886, and had been a colonel during the War of Independence, and a captain in the Rural Guard) was made second in command. The new organization was supplied with modern automotive equipment, and the personnel was placed on a military footing through the issue of printed instructions, books, enlistment cards, forms, etc., similar to those in use in the army.

The department has been growing. It serves not only the needs of the Central District of Havana, but also those of nearby municipalities. When, for instance, fire broke out in the Arechavala Sugar Warehouses of Cardenas, located at a distance of 158 kilometers from Havana, the equipment was transported over all but impassable roads. Upon arriving on the scene the fighters immediately went into action and after 48 hours of hard work extinguished the fire, thus fully meriting the congratulations showered on them by the authorities of the city.

The equipment which the department has at its disposal is as follows: the pumps are Ahrens-Fox, as is also a ladder car; the chemical extinguishers and one ladder car with mechanical elevation are of American-La France make. (See illustration.) Two chemical cars, formerly horse-drawn, have been mounted on chassis in the department's own plant. One of these extinguishers is a Seagrave and one a Holloway. There is a generator car for electric light which was also built at the plant.

The city's greatest disaster from fire occurred on May 17, 1890, at the Isasi hardware store. The whole building collapsed following an explosion of powder. Twenty-five firemen, four members of the police force, two marines, and several private citizens perished, and a large number of people were injured. In commemoration of the heroism displayed during this disaster a magnificent mausoleum was erected in Colon Cemetery, and there those who died in fullfilment of their duty lie buried.

When the Central District of Havana was established and José Izquierdo y Juliá was appointed the first mayor, he proceeded to reorganize the Department of Fire Fighting and Fire Prevention and to name as Chief of the Department the writer, who had resigned from his former Fire Department post in 1927.

American Fire Chiefs Respond to Havana's Call

The International Association of Fire Chiefs convenes there this month. Papers on the convention program include: "Reducing Incendiary Fires," by John C. Moran, Chief, Fire Department, Hartford, Conn.; "Investigating Fires," by Raoul Dauthier, Fire Chief, Montreal, Que.; "Uniform Inspection," by Frank Charlesworth, Fire Chief, Providence, R. I.; and "Keeping Down False Alarms," by George W. Hedden, Fire Chief, Buffalo, N. Y.

FORWARD STEPS

Reported by
Municipal Officials, Chamber of Commerce Executives, and Others

Ohio Installs Air Markers on Highways

COLUMBUS, OHIO.—Practically one-half of a total of 132 huge pavement air markers have been installed by the Ohio State Department of Highways at various points throughout the state. This work was begun several months ago and will be finished by November 1, this year. After installation had started, the Department changed the design somewhat for concrete pavements, in order to increase its visibility. This was done by adding a black border for the letters and other characters, which for black-top pavements are of lemon-yellow.

The signs are 12 feet high. Letters are 5 feet wide; stroke on letters 18 inches wide. "Mileage" is abbreviated "Mi" and is 8 feet high, 5 feet wide. The arrow is 24 feet long, with head 10 feet wide; spacing between letters 5 feet, and between words 10 feet. The sign gives the name of the town, an arrow pointing in the compass direction, and the mileage to that point.

EARL V. MURRAY,
Statistician, State Department of Highways.

ONE OF THE OHIO STATE HIGHWAY AIR MARKERS

Firemen's Park an Outstanding Civic Achievement

WATERLOO, WIS.—At the Firemen's Park in this town of less than 1,500 one will see farmers with their teams and implements and village carpenters with their hammers and saws working side by side as has been done for more than a quarter of a century, creating a fine recreation spot for their community. The park was organized and built, and is now managed, by the united volunteer efforts of townspeople and farmers of the vicinity of Waterloo.

In 1886 the Volunteer Fire Department of Waterloo was organized. At once it set about raising money by various means with a view to ultimately establishing a community park. The firemen established a precedent for cooperation and service which has been emulated by all who have helped in the work. Farmers caught the spirit of the thing and early began to cooperate with the villagers.

At last, in 1905, the Department was able to buy the park site, a tract of 34 acres, lying along the Maunesha River, for which it paid $3,400. That year Waterloo held her first Homecoming Celebration. This decennial affair has been held twice since then, in 1915 and 1925. The celebration of 1925 brought the largest crowd of visitors the park had ever known.

Aside from the gift of a popcorn machine, the only donation the park has ever received has been labor, and all the work done on the park has been volunteered. All money spent on improvements is first earned by the park itself.

In the spring of 1906 farmers and villagers worked together to build the first bandstand. The formal dedication ceremony was held with an elaborate program and barbecue. July 4, Labor Day and the Midsummer Festival are the regular gala periods for the park. However, it is open at all times to tourists and picnickers, and unnumbered organizations from the lower half of the state use it for outings and celebrations.

No hired labor has ever gone into improving the park. Practically every resident has had a part in making it what it is, in carpentering, cement work or improvement of the grounds. Farmers have contributed teams, plows and all sorts of equipment, have hauled dirt and brought in other materials. It is no unusual sight to see 100 people at work giving what time they can spare to the common task. The farmer works side by side with the business man and a feeling of fraternity and understanding results. The main swamp area was raised four feet and made into a baseball diamond. Around this the concave sides of a hill semicircular in shape form a natural amphitheater. Cement steps have been built into the hill, providing the seating capacity of a large stadium. Trees remain as they grew, making a natural roof for the unique grandstand. Driveways and parking spaces have been laid out and fenced off; fountains and flower gardens dot the lawns. A big cafeteria has been erected. A field house provides dressing rooms and showers for actors and athletes, and on the second floor is a dance hall, 180 by 44 feet. Comfort stations and brick stoves for cooking accommodate tourists. A recent development in the park is the filling of a second swamp and the opening of a children's playground with full modern equipment.

Handling holiday crowds is no problem here. As many as 500 volunteer workers are in charge of the crowds on big days. Farmers drive in from miles away to act as traffic officers.

Each year sees more improvements made or new equipment added, and each year sees the park organization looking forward to accomplishing bigger things. Thus not only is this Firemen's Park one of Wisconsin's most valuable and beautiful parks, but it provides an almost perfect example of town and country interest joined in cooperative endeavor.

H. C. BRUNNER,
Milwaukee, Wis.

Board of Education Tractor Aids in Improving School Grounds

RACINE, WIS.—Two new high schools have been erected in this city in recent years, on ample sites, viz., the William Horlick High School, with twelve acres, and the Washington Park High School, on a fourteen-acre site adjacent to a municipal park of the same name, which offers additional recreational opportunities to the students.

Instead of employing contractors to grade the grounds, the Board of Education purchased its own tractor, and the grading was done by employees of the Board. Incidentally, the tractor is a home product, having been manufactured by the J. I. Case Co., of this city. This tractor, of course, is being used on other school grounds in the city, and the saving thus effected has been more than enough to pay for the tractor.

F. M. LONGANECKER,
Superintendent of Schools.

Janitor Patrols for School Streets

JOHNSTOWN, N. Y.—Janitors of school buildings in Johnstown have been deputized as special officers to assist the Police Department in directing traffic at school street crossings. This step was taken because shortly before the close of the schools in June a child was killed by a car, and investigation disclosed that traffic control was insufficient at school opening and closing hours.

The Board of Education has also taken steps to have all school grounds fenced off, so that during play hours the smaller children may be kept off the streets.

ELLIS K. BALDWIN.

Wild Geese a Park Attraction

CINCINNATI, OHIO.—Burrett Woods, Cincinnati, one of the most beautiful parks in the Middle West, has, as one of its outstanding attractions, a flock of Canadian wild geese. The birds are cheap at $15 a pair in the United States, but the park authorities did not pay for these. They were the gift of the Spring Grove cemetery management, which maintains an exceptional flock on its own lakes, and has annually for several years raised a surplus.

AMUSING, TOO

There is a rock-enclosed retreat at one end of the lake in the park, where the geese nest and care for their fledglings. So far, the casualties on motor roads in the park have balanced the increase in the flock, so that the park has thus had no surplus to pass along to other officials, although it will probably have one in future.

In the summertime the geese forage for their living, and their winter feed costs little. They are the object of great interest to children and to nature-study groups. They average 40 inches in length when full grown.

FELIX J. KOCH.

A PIECE OF UNUSUAL PUBLIC SCHOOL PROPERTY

For Better Control Over Street and Sidewalk Uses

GRAND ISLAND, NEBR.—We have recently adopted a new ordinance for more complete control of the use of space on or under sidewalks, streets, alleys, and other public ways by individuals and corporations. We have always made some charge for such uses on the principle that public property should not be used for private benefit. Under the present plan we collect about $2,400 per year, and we expect it gradually to free the city of many unsightly obstructions. No retail store displays, signs, pop stands, or show cases are allowed on any sidewalk or street. Open areaways, stairways, and curb pumps now installed may remain if the occupation tax is paid, but no new installations are allowed, and each year some of the old ones are removed from the streets.

Our public property occupancy tax rates are: 20 cents per square foot for all open stairways, areaways, show windows, or other such obstructions; 2 cents per square foot for all space under any street, alley, or sidewalk. For gas, oil, or other tanks, $1 each; curb air pumps, $2; curb gas pumps or oil pumps, $12; and drive-in oil or service stations, $20. Every post or sign at the curb is $5 per year, and must conform fully with the ordinance requirements. The minimum charge for any use is $1.

Before issuing a permit of occupation, the city requires a bond of $1,000 to safeguard it in case of complaints and lawsuits such as have arisen in the past over defective coal holes, broken glass in sidewalk lights, spread gratings, etc., where the property users who were directly responsible refused to make good the damage charges.

In case the occupation tax becomes delinquent, it is then the duty of the City Street Commissioner, to close, or remove, the space or the obstruction. Failure to make application for a permit before occupying or using public property for the uses covered in the ordinance constitutes a misdemeanor punishable, upon conviction, by a fine of not over $100. The misdemenant "shall stand committed until said fine and costs are paid, and *each day that any portion of said streets, alleys, sidewalks, or public ways are so occupied shall constitute a separate offense.*"

ALBERT STEHR,
Building Inspector.

Milwaukee Inaugurates Noise Control Campaign

MILWAUKEE, WIS.—This city is determined to minimize noise as much as possible. Accordingly, action was recently taken by the city council authorizing the police to check up on unnecessary noises and make reports. The public is urged to aid the police by reporting persistent noises to the department, which in turn will investigate and make an attempt at abatement.

A long list of undesirable noises has been issued. The list includes unnecessary honking of automobile horns, prolonged factory whistles, flat tires on street cars, clanking chains on trucks, and even the persistent rattle of milk bottles by milkmen. It is hoped that the city-wide campaign will result in eliminating about 40 per cent of Milwaukee's objectionable noises.

A. P. NELSON.

Utica's Plan to Use Otherwise Unemployed Teachers

UTICA, N. Y.—In order to aid Utica's unemployed teachers, John A. DeCamp, Superintendent of Schools, has devised a plan whereby 18 of these will be given jobs without additional expense to the city. They will teach in the evening schools which open October 5.

At a preliminary meeting with the 18, who are either college graduates or graduates of the New York State Normal Schools, Superintendent DeCamp agreed to recommend their appointment to the teaching force if conditioned on their taking a three-weeks course in night school work.

Until this year the principal part of the night school instruction has been given by teachers in the school system who also taught during the day.

The three-weeks special course in night school work for the 18 is being given in the School Administration Building under the direction of Miss S. Alice Smith, Supervisor of Adult Education.

ELLIS K. BALDWIN.

Preserving a County's Attractiveness

FARMINGTON, MO. — The Highway Beautification Association of St. Francois County, Missouri, won the prize of $500 offered last year by the Missouri State Highway Commission for achievements in highway beautification. This Association is functioning for the third year as a county-wide organization. During the first year, it devoted most of its efforts to perfecting its organization, which is built around community centers, and creating public interest in a comprehensive program.

Its program last year included the planting of trees, shrubs, and flowers along the highways, especially at the entrances to towns and villages, at intersections of roads, at resorts and gasoline stations, and at other conspicuous points. One of the principal planting projects was a collection of trees from foreign countries.

St. Francois County is part of a land grant from Spain. Among its early settlers are many French, English, and German people. Being rich in minerals, it now draws people from all parts of the globe. By the planting of trees from the native countries of its residents, it is hoped that a feeling of welcome and friendship will be created.

Another task undertaken was that of improving the appearance of mail boxes along the rural route on U. S. Highway 61. This highway traverses the county from north to south for a distance of forty miles. Rural route patrons were asked to provide good new boxes. The Association furnished uniform posts, painted black, and had the boxes painted with aluminum paint and lettered in black.

A prize was offered for the best slogan submitted. The one selected read as follows: "Enjoy, do not destroy St. Francois County's woods and flowers." This slogan has been adopted by the whole state, substituting "Missouri" for "St. Francois County." Property owners along the highways have been urged to make their premises attractive and conserve what natural beauty is already there. A set of governing rules was drafted and adopted by the Association. These, too, are being used as a model for all similar organizations throughout the state.

This year's program is along similar lines, only more extensive. Much clean-up work along the highways is being done. War has been declared against unsightly signs; about twenty wooded tracts along the highways are being preserved and made more attractive. They have all been marked as woodland preserves and bird sanctuaries.

C. C. SCHUTTLER,
President, St. Francois County Highway Beautification Association.

An Aquatic Park Project

GLADSTONE, MICH.—We are developing an aquatic park which will include a boat lagoon with a system of shallow canals and several islands, a landscaped land area, and three rustic bridges. The park will extend for the length of about three city blocks, with an average width of 450 feet, and will be separated from the waterfront of beautiful Bay de Noc (an arm of Lake Michigan) by a narrow ridge of land forming an island. It will be near the tourist camp building in our present park. Owing to the swampiness of the site, the small boat harbor and canals require little excavation.

The boat harbor is 300 by 450 feet, and connects with the Bay by a 50-foot channel. From the harbor lead two boat canals, totaling 2,400 feet long, 60 feet wide at the surface edge of the water line, and 30 feet wide on the bottom. These canals join at the west end and have an outlet to the Bay opposite the city's bathhouse.

The completed canals and harbor will have a water surface of approximately 26,000 square yards and 4,860 lineal feet of interior shore line. There will be 57,000 square yards of ground surface in the development. The cost of excavation will be $8,700, estimated at present low prices. To this will be added the cost of seeding the land, amounting to $570, the cost of the rustic bridges, amounting to $1,800, and the landscaping cost, which covers trees and shrubs and totals $1,800, making a total of $12,870.

Canal excavations will extend over two more years. Landscaping and seeding and the bridge construction will be carried out the two following years, thus consummating a five-year development program on a pay-as-you-go-basis.

F. R. BUECHNER,
City Manager.

NEW YORK INTENSIFIES WARFARE ON CRIME

AS one measure in its campaign for combating the crime situation, which some time ago began to assume a critical appearance, the New York Police Department put into use for day and night patrol purposes in certain districts a fleet of armored motorcycles with armored sidecars. The pursuit and capture of criminals with automobiles is a difficult and uncertain matter under the present conditions of traffic on city streets. The armored motorcycles greatly facilitate such work because of their speed and small size, and the ease with which they can be maneuvered.

The best marksmen in the police forces man these motorcycles. The men in the sidecars are armed with 12-gage short-barrel repeater rifles, and the armored cars, which are manufactured by the Indian Motocycle Co., are all equipped with left-hand throttle control.

THE CITY'S LEGAL RIGHTS AND DUTIES

Conducted by A. L. H. STREET, Attorney at Law

Public Property

Grant of land for harbor purposes did not permit city to lease same for oil development.

In 1917 the California Legislature granted certain tide-lands to the city of Venice for harbor purposes, etc., with power to lease the same for purposes consistent with the grant. In *Stone v. City of Los Angeles*, 299 Pac. 838, the California District Court of Appeal decided that the lands could not be legally leased for development of underlying oil.

Utility Acquisition

Proposals to purchase water works plant and issue bonds therefor held properly submitted to electors as single question.

Approving the form of a ballot, under proposals combined in a single question to be voted on, the South Carolina Supreme Court said in *McDaniel v. Bristol*, 158 S. E. 804:

"The proposition submitted to the voters of Beaufort asked them, in short, this main question: 'Will you issue bonds in the sum of $40,000, the proceeds of which are to be applied solely for the purchase of the water works plant?' From the question, the voters of Beaufort knew they could not buy the plant unless the city could pay the purchase price; they knew the purchase price was $40,000 or less; they knew that the purchase price could only be paid by the issue of municipal bonds. When they answered 'Yes' to that question, they clearly said to the city council: 'Buy the plant at a price not exceeding $40,000, issue municipal bonds therefor, and pay the sellers the purchase price.'"

Official Ineligibility

Board member automatically removed from office, under a Kentucky statute, when his company sold supplies to board.

A Kentucky statute provides that the office of a board of education member shall become automatically vacant upon his becoming interested in a contract with or claim against the board. Applying the provision to a member who was president of, and held one-third of the stock of, a corporation that sold small bills of supplies to the board, the Kentucky Court of Appeals said in the case of *Douglas v. Pittman*, 39 S. W. 2d, 979:

"It cannot be denied that he is interested in any business done by the Victory Motor Company. He is president of the company; he owns one-third of the stock; surely he is directly interested in the welfare of that company, and its welfare is wholly dependent upon its business. . . .

"While these statutory provisions in their operation seem severe, they were not intended to punish members of the boards of education, and perhaps in some cases work undeserved hardships upon members when the acts condemned were prompted by no improper motives. There is, however, no distinction made, and none can be made, between the different character of transactions. We are not justified in the inquiry whether these acts were profitable to the members or otherwise. The statutes prohibit the act. No ulterior motive is intimated in this record and no culpability attaches by the circuit court's judgment or this opinion to the deposed members of that board. These members are guilty of no acts involving even a semblance of moral turpitude. They have merely transgressed the provisions of a statute, perhaps inadvertently. They must, however, suffer its penalties."

Important Legal Decisions

involving municipalities, as reported in this department during 1930, are indexed and classified in the 1931 Municipal Index. This reference list, commencing on page 147 of the 1931 Index, supplements similar lists appearing in the 1930 and 1929 volumes, while the 1928 Index contained a list covering 1924 to 1927, inclusive.

Public Utilities

Public utility accepting franchise on prescribed conditions not against public policy is estopped to deny the validity of those conditions.

"When a municipal corporation has the power to grant or refuse in its discretion permission to a public service company to occupy the streets with its structures, it may grant such permission subject to such conditions as it may see fit to impose, provided they are not against public policy or in derogation of any right which the company may have under its franchise from the state. The municipality, by means of such conditions, may impose obligations upon the company which it would have no power or authority to impose under its general charter powers, and, if the company accepts the grant, it is bound by the conditions, and is estopped to question their validity." (*Todd v. Citizens' Gas Co.*, 46 Fed. 2d, 855, decided by United States Circuit Court of Appeals, Seventh Circuit.)

Tree Nuisances

Regardless of statute, a cottonwood tree obstructing a sewer held an abatable nuisance.

The right of defendant to remove a cottonwood tree standing within a curb line because its roots clogged a nearby sewer was upheld by the Court of Common Pleas for Dauphin County, Pennsylvania, in the case of *Dare v. City of Harrisburg*, 22 Pa. Munic. Rep. 175. The Court said:

"In the instant case there is no question of the removal of the tree for the purpose of making municipal improvements, thus exercising the power of eminent domain or merely removing the tree to plant a tree of another kind, which may not be any better adapted to the soil and environment. The question is whether the city has the right, in the exercise of its police power, to direct the removal of a tree which has become a nuisance. We base our decision on that proposition alone.

"It is a serious matter to destroy a beautiful shade tree and thus somewhat diminish both the market value and the advantages of one's home. But when the tree has become a nuisance and the municipal authorities have upon proper evidence so determined, the Court cannot say that a determination to remove such tree is either arbitrary or unreasonable."

Taxable Property

Public property held not taxable, except as expressly provided.

Dealing with the right of a town to tax a village district's water works property, the New Hampshire Supreme Court applied a local statute, and incidentally said (*Lisbon Village District v. Town of Lisbon*, 155 Atl. 252):

"By the long-established policy of our law, property publicly owned, used for public purposes and located within the territory of the holder, is not taxable. In order to make it taxable, there must be an express provision to that effect, or language open to no other reasonable construction."

Occupation Taxes

City held not entitled to impose charge for use of sidewalk as means of access to and from filling station on private property.

Interpreted as imposing an annual charge of $24 upon each "drive-in" filling station maintained on private property, an ordinance of defendant city would be unconstitutional, declared the Texas Court of Civil Appeals in *Gulf Refining Co. v. City of Ft. Worth*, 36 S. W. 2d, 285. In part, the opinion reads:

"Our courts have uniformly held that a municipal corporation may grant the use of its sidewalks or streets to persons for private use and charge a fee therefor, provided same does not interfere with the use of the general public therein. . . .

"It is well settled that the owner of property abutting the street has a right of ingress and egress to his property, and neither the legislative bodies nor the courts can take said right away, neither can they unreasonably abridge same.

Whether appellee could forbid any of the appellants from operating a station at the designated place, or could have refused to grant them a permit for the gasoline station to have been erected at the time same was given, are not involved in this litigation. Each of the appellants, in conformity with the city ordinance, enacted by appellee, did make application to the proper authorities and paid the required fee of $5 and obtained a permit to erect their respective gasoline filling stations, and same have been built in conformity with the ordinances of appellee."

Street Widening

That building encroached on street for nearly 50 years did not entitle owner to compensation for forced adaptation to street widening.

When Hartford widened a street, an abutter claimed damages for the expense of adapting a building that had been permitted for nearly fifty years to encroach upon the old street line. Said the Connecticut Supreme Court of Errors and Appeals (*Appeal of Phillips*, 154 Atl. 238):

"If . . . the city permits a portion of a building to stand beyond the street line, it is a matter of grace, and, unless its rights are lost by abandonment or otherwise, it may at any time thereafter remove or require the removal of that portion of the building without obligation to make further compensation to the owner. . . .

"Under the facts in this case we cannot say that as matter of law there had been an abandonment by the city of its right to require the removal of the building. As it was an unlawful encroachment the damages to be paid upon the widening of the street could not properly include any expenses involved in adapting it to the new street line."

Rate Arbitration

Street railway franchise provision for arbitration of rate of fare dispute sustained.

Where a street railway franchise authorized a change of fares at the end of each five-year period, and arbitration in case of disagreement, the Ohio Court of Appeals in Cleveland upheld an award made by arbitrators, fixing a rate of fare, in the case of *Parks v. Cleveland Railway Co.*, 176 N. E. 472, saying:

"Since a franchise for the operation of a public utility granted by a municipality is designated in the constitution as a contract, it comes within the general rule which permits municipal corporations, in the absence of an express prohibition, to submit controversies to arbitration."

Business Regulation

Ordinance regulating wholesale food establishments held authorized by Illinois statutes.

Statutory authority to regulate the sale of meats, vegetables and "other provisions" sanctioned an ordinance embracing such wholesale food establishments as those dealing in tea, coffee, spices, etc. (*City of Chicago v. Arbuckle Bros.*, 176 N. E. 761.) The Illinois Supreme Court said:

"The city council is authorized to regulate the sale of food in regard to the place of selling, the manner of selling and inspection, to compel the occupant of any building to keep it in a sanitary condition and conduct his business in such a manner as not to endanger the health of his employees or the public, . . . and for the purpose of such regulation to license the business of the sale of food and make such reasonable rules as are appropriate and necessary to assure sanitary conditions in the care of the buildings or rooms in which the business is carried on and in the conduct of the business. . . .

"Under the police power, things which are injurious to the public may be suppressed or prohibited. Other things which may or may not be injurious to the public, according to the way in which they are managed, conducted, or regulated, may be licensed for the purpose of regulation. . . .

"All are required to have a license, and it is no defense to a charge of carrying on the business without having a license that the business was conducted strictly according to the terms of the ordinance."

Liability Immunity

City held not liable for negligence of driver of horse-drawn vehicle used in hauling ashes and refuse, that being a governmental function.

A wagon used by defendant city in hauling ashes and refuse to a dump was driven against a pedestrian, but the Pennsylvania Supreme Court holds that, even if the driver was negligent, the city is not liable, because the vehicle was being used in the performance of a governmental function. (*Bandos v. City of Philadelphia*, 155 Atl. 279.)

Had it been a motor-driven vehicle, although used for precisely the same purpose, the city might have been held liable, because an act of 1927 imposes liability upon municipalities for damages caused by negligent operation of motor vehicles. Said the Court:

"We cannot legislate under the guise of judicial construction and extend the definition of motor vehicle to include the defendant's wagon."

Street Accidents

City permitting contractor to obstruct street held bound to see that he guards travelers against injury.

A pedestrian in Charleston, S. C., was injured through falling over débris placed in a street by an excavator of pavement, etc. Deciding that judgment against the city was proper, the South Carolina Supreme Court said in *Walsh v. Dawson Engineering Co.*, 157 S. E. 447:

"Especial stress is laid upon the point that the evidence indisputably shows that the person who was doing the excavation in the street was the servant of an independent contractor, for whose acts the defendant, the city of Charleston, was not responsible. . . . If it were conceded that such employee was the servant of an independent contractor, the fact remains that the city council was not thereby relieved of its primary obligation to see that its streets are kept safe for traffic. It would be dangerous to establish the doctrine that a municipal corporation could turn over its streets to an independent contractor to be used as he pleased, with no supervision by the city, and, when rendered unsafe for use by the independent contractor, relieve itself of liability behind the plea that the act complained of was the act of the contractor. Its duty remains to see that the contractor, in the pursuit of the purpose for which he has been granted the right to use the street, takes proper precautions for the protection of the public."

Special Assessments

City commission could, but was not bound to, consider tardy objections to a special improvement assessment.

In a case involving the validity of a street improvement assessment and a statute authorizing filing of objections to assessments, the Alabama Supreme Court said in *Goodman v. City of Birmingham*, 135 So. 336:

"Under this statute, objections filed with the clerk on the afternoon of the day set for hearing, but after the hour set for hearing, and after the city commission has made its order confirming the assessment, and adjourned, came too late. However, the commission had power to reopen the matter and hear objections so filed."

Dieting Prisoners

Agreement by jailer to accept less than statutory rate for dieting city prisoners was not binding upon him, because against public policy.

Because of the tendency to cut down city prisoners' diet, the Kentucky Court of Appeals lately decided that a county jailer's agreement to accept 75c per day for boarding city prisoners, instead of $1 a day as allowed by statute, was not binding upon him, and therefore did not preclude his recovering the statutory rate. (*Mack v. City of Mayfield*, 39 S. W. 2d. 679.) Said the Court:

"In the recent case of *City of Winchester v. Azbill*, 225 Ky. 389, 9 S. W. 2d. 51, the precise question was before us, and we there held that a contract whereby a county jailer agreed to accept for keeping and dieting city prisoners under authority of Kentucky Statutes, section 2228, a different fee from that fixed by section 1730, Kentucky Statutes, as amended by Acts 1920, c. 137, was contrary to public policy, and void, and that the jailer could not estop himself from claiming and recovering full payment for keeping and dieting city prisoners where a part of such compensation was withheld under such illegal agreement. The fact that the agreement in this case was made in consideration of the city's not constructing a city workhouse is not sufficient to alter the rule."

TRAFFIC CONTROL AND FACILITATION

Conducted by the Institute of Traffic Engineers, 175 Fifth Avenue, New York

Publications Committee: Maxwell Halsey, Chairman, Hawley S. Simpson, Harry H. Hemmings, Arthur G. Straetz

Centralized Traffic Control in Pennsylvania

THE expansion of motoring habits, bringing an increase in inter-city travel by automobile has made vitally necessary the uniformity and co-ordination of traffic plans throughout every state. Recently there has been some activity along this line.

In 1928 Massachusetts passed a law which established the Department of Public Works in a supervisory position, and required that all local authorities receive its written approval before the installation and operation of any traffic control device or regulations relative thereto.

In 1930 New Jersey succeeded in establishing a Traffic Commission, independent of existing agencies, which has roughly the same supervisory powers over local authorities.

Now in 1931 Pennsylvania has followed, and the Secretary of Highways is given powers quite similar to those found in Massachusetts and New Jersey. The Secretary of Highways is directed to make and publish regulations for the design and location of all traffic signs, signals and markings, and, so far as possible, conform with the system adopted in other states. The local officials are directed to follow these regulations, and a $100 fine is established for the violation of certain privileges. The Secretary of Highways is authorized to remove, alter, or adjust any signs, signals or markings which do not conform to its regulations. Definite specifications are set up in the law for traffic signals which, while at present uniform and representing good practice, will be difficult to change as conditions vary.

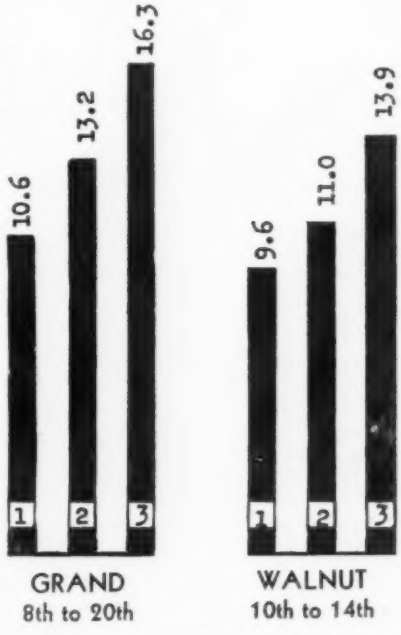
There are several other recent changes in the Pennsylvania motor-vehicle law which warrant some comment. The law makes it possible for the Commissioner of Motor Vehicles to refuse to register any used vehicle which does not have evidence of recent inspection and approval of an official inspection station. The state is given authority to require inspection of motor vehicles as frequently as it deems advisable. It is understood that the Commissioner intends to require inspection once every four months, and to employ a systematic check-up for three months following each inspection. He is also given more extensive powers over the examination of motor-vehicle operators. Cities, boroughs, incorporated towns and townships are made jointly and severally liable with any member of a volunteer fire company for any damage caused by the negligence of such member while operating such vehicle while going to or returning from a fire.

Passing to the right is authorized on any highway within a business or residential district having two or more marked lanes for movement of traffic in one direction. Local authorities in certain classes of cities are authorized to impound parked vehicles for violation of parking regulations, but certain restrictions are placed upon them for the protection of the motorist.

Coordinated Signal System and New Traffic Code Increase Automobile Speed 50 Per Cent in Kansas City

ACCORDING to the City-Wide Traffic Committee in Kansas City, stop-watch checks were made at three times: (1) in the fall in 1929 before signals were installed or code changed; (2) in the spring of 1930, after the signals were in operation; and (3) in March, 1931, after the new Traffic Code was in effect.

It is interesting to note from the graph that the improvement in speed due to the two changes, coordinated signals and a new code, was about equal. The 50 per cent increase in automobile speed over the area affected is an excellent example of what may be accomplished by engineering studies.



This shows increased average speeds of motor vehicles on Grand and Walnut Streets, Kansas City, due to signal lights and traffic code: (1) before signal light system was installed; (2) after signal light system was installed, but before traffic code was in effect; (3) after traffic code was in effect

For a group of items on traffic safety, see page 19.

Institute Affiliate Member Gives Graduate Course in Highway Traffic Control

TRAFFIC engineers will be glad to learn that the Polytechnic Institute of Brooklyn is giving a graduate course in Highway Traffic Control. Assistant Professor Lloyd P. Rader, who is an affiliate member of the Institute of Traffic Engineers, is giving the course. The following is a description of the course:

G 284. Highway Traffic Control.—The course consists of lectures, recitations, assigned readings, and reports. The following subjects are considered: statistics; traffic surveys; causes of congestion; the safety problem; city planning and street design; zoning and decentralization; regulation of moving traffic; the parking problem; regulation of pedestrians; traffic signs and signals; traffic codes; insurance laws; organization and functioning of traffic bureaus; treatment of offenders; traffic educational campaigns. The instructor is assisted by special lecturers.

One and one-half hours a week for ten weeks. Lecture, Wednesday 7:30 to 9:00 P. M., beginning March 2.

Assistant Professor Rader and associates.

Fee, $15.

It is hoped that other universities will follow this example and that better educational opportunities may be offered to this growing field.

Traffic Engineers to Meet

PLANS for the annual meeting of the Institute of Traffic Engineers, to be held in Chicago at the Stevens Hotel, October 15, have been completed. The program follows:

MORNING SESSION

9:45 Reports of Committees
- Research, Major John P. Halliban, Chairman
- Professional Curriculum, Dr. Miller McClintock, Chairman
- Terminology and Nomenclature, Guy G. Kelcey, Chairman
- Evolution of the Art of Traffic Control and Regulation, Earl J. Reeder, Chairman

Members' Theses and Discussion

LUNCHEON

12:30 Business Meeting
- Election of Officers
- Amendments to Constitution and By-Laws
- Other Business

AFTERNOON SESSION

2:00 Traffic Signal Manufacturers "Free-for-All"
- Presentation of Outstanding Features of Traffic Control Equipment by Representatives of Traffic Signal Manufacturers
  - Acme Traffic Signal Co.
  - American Gas Accumulator Co.
  - Crouse-Hinds Co.
  - Eagle Signal Sales Co.
  - Essco Manufacturing Co.
  - General Electric Co.
  - Horni Signal Manufacturing Corp.
  - Tokheim Oil Tank and Pump Co.
- Discussion

DINNER

6:30 Annual Dinner
- Followed by Open Forum Discussion of Traffic Signal Standardization

Informal sessions are planned for Monday and Tuesday evenings.

Systematic Lamp Replacement Minimizes Dark Traffic Signal Hazard

By **E. W. BEGGS**
Commercial Engineering Department, Westinghouse Lamp Company

THE electric traffic signal is now in a position of trust. Its dependability is a matter of paramount interest to every one. No single item affecting its sure, precise, and consistent performance can well be ignored.

Lamp Outages Increasingly Serious

The position of public trust emphasizes the importance of lamp maintenance. The average signal lamp burns out in about 1,500 hours, the tungsten filament wasting away gradually until it melts through at some point and causes the lamp to burn out. On the average, therefore, there will be a lamp outage, resulting in a "dark signal," for every 1,500 lamp-burning hours in traffic signals throughout the country. So hazardous a condition should be eliminated. It can never be entirely eliminated as long as human beings err and man-made devices fail, but it can be reduced greatly by rather simple means.

The surest and most fundamental way is with a duplex or multiple system having no moving parts.

Replace Lamps Before They Burn Out

Although the use of two or three lamps for each color in traffic lights will eliminate "dark signals," it does not solve the problem in the thousands of single lamp traffic lights now in use. A scheme which would permit replacing each lamp before it burns out would solve this problem. The practical solution lies in the use of systematic lamp-replacement schedules laid out on a scientific basis.

Such schedules adopted for traffic signals have been in use for several years by railroads. The success of these schedules is based on the fact that, although individual traffic signal lamps, like all Mazda lamps, burn out at varying "ages," the majority fail at close to the average life of the group. The so-called "mortality curve" shows this quite clearly. The average of the entire group, which in this case represents hundreds of lamps accurately life-tested by manufacturers, is about 1,500 hours. Initial failures occur after a few hundred hours, but some lamps burn as long as 3,000 hours. Over 85 per cent of the lamps, however, burn more than 1,000 hours before failing.

The relamping schedule is derived from the mortality curve. The theory as well as the practice is extremely simple and entirely under control. Lamp outages may be reduced to the vanishing point if renewals are made early enough. On the other hand, if a small percentage of outages can be accommodated, relamping may be carried out further along the mortality curve. In general, conditions alter cases, but since there is a knee in the curve at about 1,000 hours life, that point, or near it, is generally selected and used.

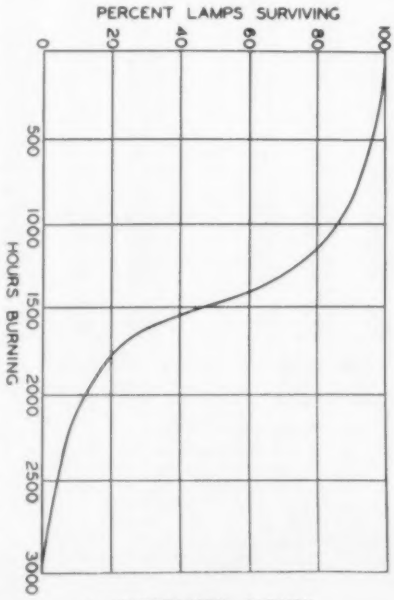
Naturally, a plan of this kind requires that the lamp manufacturer first maintain a high level of lamp-life uniformity, which he is committed to do.

Several Factors Influence Lamp Life

However, the lamp maker alone cannot control lamp life. Proper voltage at the lamp socket must be maintained. In general, the voltage should average exactly at the value for which the lamp was designed, with minimum fluctuation from that value.

A third factor of considerable importance, in addition to the inherent quality of the lamp and the voltage control, is mechanical stress. Lamp filaments are quite brittle while cold and rather soft when incandescent. Also, vibration of a certain character may have a bad effect on the crystalline structure of the tungsten metal filament, causing it to become more fragile than its normal state. For these reasons extreme vibration and, of course, severe shock to the lamp, should be avoided, but generally they are not serious in the case of curb-mounted signals. Where vibration is severe, rubber cushions or spring supports may be used to cradle either the entire signal or just the lamp socket. Any condition of mechanical stress is bad and should be eliminated by the signal engineer.

Glass bulbs of traffic signal lamps occasionally become cracked or develop leaks after leaving the factory. Filaments are sometimes injured in transport and handling. For these reasons it is best to observe each new lamp for a few minutes' burning after it is installed in the signal. Rapid discoloration of the bulb or other signs of damage indicate an undesirable lamp. It should be replaced and the test repeated.



A "MORTALITY CURVE"

Data from performance tests, made by the manufacturer, for the Standard 60-watt, 115-volt Mazda traffic signal lamp

If a relamping program is to be established, the mortality curve can be used as the principal reference, but the per cent of "dark signals" which can be justified must also be determined—a matter of judgment involving experience with "haphazard" relamping and a study of traffic. The procedure and relative results obtained by relamping schedules are best explained by means of an example:

Assume the traffic to be average as in a suburban territory near an important city. All signals are of about equal importance. Local traffic police patrol the area frequently, reporting any lamp outage within a few hours of failure. Assume that 400 three-color signal units using 1,200 lamps comprise the system. All signals operate on a regular cycle from 4:00 A.M. to 11:00 P.M. Between 11:00 P.M. and 4:00 A.M. the amber or the red lamp is flashed, one second on and one second off. With these conditions, one or another of the three lamps in each group burns from 4:00 A.M. to 11:00 P.M. (19 hours) each day. One lamp in each group of three flashes half the time from 11:00 P.M. to 4:00 A.M. (2½ hours). The total lamp-burning hours per day per signal are therefore 21½ hours, and 8,600 for the 400 signals. If all lamps were burned until they failed and then replaced "haphazardly" when and as reported, the relamping crews would renew an average of 5.7 lamps (8,600 ÷ 1,500) per day throughout the year. Actually, the renewals would vary from practically none per day, when the lamps are new, to as high as 20 lamps per day when they reach the age of highest mortality.

A renewal schedule for such a set of conditions would be quite simple and effective, since all signal lamps could be removed and replaced by new lamps at a predetermined date after they are installed, the renewal date being set for each color and each location accordingly as the burning hours per day vary. Replacements, of course, are made in conjunction with regular routine service of the signal.

Incidentally, such a plan in actual use invariably shows an immediate saving in money. Before the renewal scheme becomes effective, relamping crews are on

call day and night. The so-called "epidemics," which come when the 1,500-hour point is approached, often require additional lamp-maintenance gangs, and even then the number of dark signals is appalling. With the recommended relamping scheme, "epidemics" can be entirely eliminated. In addition, removing all lamps at the 1,000-hour point eliminates reduction in the brilliancy of the signal because of the lamp-bulb blackening.

Modified Plans Are Practicable

Although the foregoing relamping schedule represents perhaps the most complete and possibly the ultimate plan and is recommended, simpler ones exist. One city, for example, closely approaches the ultimate in simplicity of renewing all lamps in each group of three when one burns out. Another achieves good results by relamping all sockets every six months. Still another relamps only the red signals on a fixed schedule, but, to be safe, renews all after about 750 hours of burning. With the data known, the best plan may be selected for any particular group of conditions.

Theoretically, a relamping schedule is a simple and convenient solution of the dark-signal problem. Practically also, it is successful, and economical. But beyond money is the consideration of human lives. It is on this basis that renewal schedules are recommended.

Prepared by
FRANK B. WILLIAMS
Author of "The Law of City Planning and Zoning"

ZONING and PLANNING NOTES

From Data collected by the Zoning Committee of New York (233 Broadway)

Commercial District—Filling and Repair Station

ALABAMA.— *Block v. McCown*, 135 So. 633.—The location and operation of a filling and tire-repair station in a district zoned for commerce, and not a nuisance in fact, is proper, and an injunction against it is properly refused.

Zoning Ordinance—Notice

CONNECTICUT.—*Katz v. Higson*, 155 Atl. 507.—The publication of an ordinance which constituted no more than a mere notice that a zoning ordinance had been enacted, leaving interested persons ignorant of them to ascertain its terms, is insufficient.

Land Under Water

FLORIDA.—*Silver Springs Paradise Co. v. Ray*, 50 Fed. 2d. 356.—The public right of navigation includes boating for pleasure.

The carrying of passengers for hire in glass-bottom boats on navigable water for sightseeing purposes is an exercise of the public right of navigation and cannot be enjoined by a riparian owner also owning the submerged land over which navigation occurs.

NEW YORK.—*Application of City of New York*, reported in *N. Y. Law Journal*, September 4, 1931.—Title to upland which becomes land under navigable water by avulsion does not vest in the state as land under water, but remains in fee in the original owner.

Streets—Parks—Zoning, Constitutionality

GEORGIA.—*Howden v. Mayor and Aldermen of Savannah*, 159 S. E. 401.—Under the zoning ordinance of the city of Savannah, which prohibits the erection of certain buildings fronting on Forsyth Park, where the side of a lot fronts on a street and is separated from the park by the street, the lot fronts on the park.

Under the state constitutional amendment, the zoning empowering act and the zoning ordinance of the city passed in pursuance of it, are valid; nor are they void, if reasonably applied, under the state or national constitution.

Residential Neighborhood—Veterinary Hospital

KANSAS.—*City of Fort Scott v. Brown*, 300 P. 1093.—In the absence of a zoning ordinance, the city is nevertheless entitled to maintain an action to abate a public nuisance resulting from the operation of a veterinary hospital in a residence portion of the city.

Private Covenants—Residence

MICHIGAN.—*Lemmon v. Wineland*, 237 N. W. 527.—Pieces of a lot remaining after condemnation proceedings cannot be restricted by private covenant to residential purposes where they are no longer practicable for such purposes.

In determining whether restrictions to residence purposes are practicable, regard must be paid to restrictions imposed by the State Housing Law.

Housing—Public Aid*

NEW JERSEY.—*Simon v. O'Toole*, 155 Atl. 449.—The ordinance of the city of Newark authorizing a contract between the city and a private corporation for the reconstruction of certain blocks with modern housing facilities and parks and playgrounds is within the legal powers of the board of commissioners to adopt. It is not invalid as contemplating the expenditure of public funds to aid a private enterprise.

"The city's obligation to purchase this land and to pay to the Prudential the contract price does not arise until the primary public purpose of the ordinance has been accomplished, namely, the submission to the city of a housing project satisfactory to and approved by the city, raising the resultant obligation of the Prudential to complete the project and thereby eliminate two blocks of unsafe and unsanitary dwellings. Once that object has been attained, the city is ready to provide for parks and playgrounds in the neighborhood which shall be available not only to the new housing facilities but are to be maintained by the city for the benefit of the public at large. For the acquisition of land for the latter purpose, and for that alone, the city undertakes to expend public funds.

"The prosecutors urge that, because the commissioners admittedly were moved to their judgment to purchase the land in question for parks and playgrounds by a consideration of the incidental benefit to the public that would result from construction of the housing facilities, the motive for their actions vitiates the legality of the purchase. But we think that his view confuses the motive of the action with the character of the action itself. The legality of legislative action directed towards an admittedly public purpose cannot depend upon whether or not particular benefit may result to property and individuals in the immediate neighborhood."

Residential District

NEW YORK.—*Fox Meadows Estates, Inc., v. Livingston, Building Inspector of Village of Scarsdale*, Appellate Division, Kings County, reported in the *New York Sun*, July 20, 1931.—In an appeal from the Supreme Court, the upper court holds that the zoning of the land in question as a residential district from which apartments are excluded is valid. This is a reversal of the decision in the lower Court. A report of the case below, giving the facts, will be found in these Notes for June, 1930.

Parks—Streets—Special Assessments

NEW YORK.—*Matter of Assessment of Cost of Improvement of Central Avenue, Schenectady*, 140 Misc. 727.—In this proceeding for the cancellation of assessments by the city of Schenectady for street improvements, it appears that the city acquired the tract of land for park purposes by condemnation in 1913, and some six years later the Common Council of the city enacted an ordinance attempting to detach from this park property a strip of land sixty feet in width, which it designated as a street. Thereafter the city made certain improvements, requested by the petitioners, and assessed their property for their proportion of the expense.

Land acquired by a municipality by purchase or condemnation for a park and

* See THE AMERICAN CITY for July, 1931, page 129.

not subject to the terms of any gift, devise, grant or bequest or any other trust or condition, is under the control of the legislature, and the property cannot be used for purposes other than those for which it was so acquired without express authority of the legislature. The law allowing the city to establish streets, etc., does not grant authority to discontinue a park and so use such land.

The petitioners in this case, who signed the request for the improvement, had a right to assume that it would be made lawfully. They are not, therefore, estopped from demanding the annulment of the assessments against them, but are entitled to such annulment.

Parking Regulations

NEW YORK.—*Decker v. Goddard*, 233 App. Div. 139.—Plaintiff resides, and his premises abut, upon Plymouth Avenue, a public street in Rochester. Defendant parked his automobile at the curb, immediately in front of plaintiff's residence, for a considerable number of days and for several hours a day, under a claim of right and against plaintiff's protest. This action is to enjoin defendant from so doing. Relief granted, as asked for.

A city ordinance prohibits parking in streets for more than six hours. This is not a permit to park for that time, but a penal ordinance. The conduct of this defendant was an interference with the plaintiff's easement of access to his residence, of light and air, and the privilege of making observations without unlawful obstruction as to what was happening in the street. Such a violation of plaintiff's rights is a private nuisance, and damage will be presumed. Direct proof of damage is not essential.

Zoning—Variance

NEW YORK.—*Matter of Mark Block Holding Corporation (Warshaw et al.)*, Supreme Court, Kings County, reported in *N. Y. Law Journal*, September 1, 1931. —Certiorari proceedings from a decision of the Board of Appeals of the city of Long Beach varying the zoning ordinance for unnecessary hardship and under the provision allowing extension into an adjacent more restricted district. The decision was reversed. Said the Court:

"The power conferred upon this board is not limitless and unrestricted but must be used in harmony with the underlying purpose of the ordinance and applied reasonably to maintain and not abolish the distinctive classification created by the ordinance * * * No surer way of destroying rather than safeguarding the character of a restricted district exists than permitting a plot 100 x 100 feet in a highly residential zone to become part of an apartment site merely because the contiguous plot of like dimensions in the same ownership and apartment zone can be coupled for a large apartment operation.

"Cases considering similar zoning provision exceptions condemn any attempt to do other than permit a slight use extension, and the reasoning sustaining even a slight extension is based on the recognition of the principle that the permission to add a few feet of a restricted plot to a large operation on an unrestricted plot, where the use of the unrestricted would be prevented if permission were withheld, is a reasonable application of discretion, consonant with the purpose of the zoning resolution itself and having no material or substantial effect upon its general purpose. Accordingly, I consider that this application was improperly granted, that this order must be allowed, and the decision of the Board of Appeals of the City of Long Beach reversed."

Slaughter House

NEW YORK.—*People ex rel. Defedi v. Department of Health of City of New York*, Supreme Court, New York County, reported in *N. Y. Law Journal*, August 1, 1931.—The charter of the city of New York empowers the Department of Health to make regulations and adopt rules for the enforcement of the Sanitary Code. Accordingly it adopted a regulation forbidding the erection of a slaughter house within 500 feet of any church, public park, public playground, or other public institution. *Held*, that this regulation is valid.

Zoning—Penalties

OKLAHOMA.—*Wright v. City of Guthrie*, 1 P. (2d) 162.—A zoning ordinance is not invalid in providing that each day's violation thereof shall constitute a separate offense.

Zoning—Boards of Appeal—Variances

RHODE ISLAND.—*East Providence Mills Inc., v. Zoning Board of Review of Town of East Providence*, 155 Atl. 531.—The refusal of the Board to allow an exception to the zoning ordinance to permit mill owners to extend mills over adjoining lots was, under the circumstances of this case, an abuse of discretion.

Private Covenants—Cost of Buildings

TEXAS.—*Dellaughter v. Hargrove*, 40 S. W. 2d, 253.—The violation of a restriction in conveyances in a subdivision forbidding houses costing under $1,800 will be restrained regardless of the question of injury and damage.

Boards of Appeal in Chicago

The City Council of Chicago, on July 30, 1931, passed an interesting amendment to its zoning ordinance. The readers of these Notes for December, 1929, will remember the report of a decision of the highest court of that state in *Welton v. Hamilton* (176 N. E. 333), that:

"The statute conferring upon the City Council of Chicago the power to establish a board of appeals with authority to vary the zoning ordinance to obviate practical difficulties and unnecessary hardship, is not in accordance with the constitution of the state of Illinois, in that the law does not lay down any general or specific rules in accordance with which the board shall act, but leaves it to proceed upon its uncontrolled discretion."

In a note on this decision, your editor said:

"The requirement that, in order to be constitutional, a law giving an administrative body discretionary power must lay down rules in accordance with which it shall exercise that discretion, is universally recognized. The decision in this case, however, that the well-known provision of zoning enabling acts with regard to practical difficulties and unnecessary hardship which the statute authorized and the ordinance contained is not a sufficient rule for such boards to act upon, is contrary to the weight of decision on this subject. (See "Zoning Cases in the United States," by Edward M. Bassett and Frank B. Williams, published by the Regional Plan of New York, 130 East 22nd Street, New York, and subsequent Zoning and Planning Notes in this magazine.) The decision in this case, as a reading of the opinion would seem to show, is based upon a line of cases peculiar to Illinois."

In consequence of this decision, the amendment which has now been adopted by the City Council of Chicago confers power upon the Board of Appeals of that city, in cases of appeal to that body for a variance to obviate practical difficulties or particular hardship in carrying out the strict letter of the ordinance, to recommend variations to the Council for passage as amendments to the zoning ordinance. It is interesting to note that any proposed variation not having the approval of the Board of Appeals shall fail unless adopted by a favorable vote of two-thirds of all the elected members of the Council. An instance of the type of such variances is one granted by ordinance to Frank Sirotzki on April 10, 1931, allowing him to erect a three-car private garage at 2245 Lewis Street. Evidently Illinois must expect much "spot zoning" such as is complained of in California and the few other states without zoning boards of appeal.

An interesting analysis of *Welton v. Hamilton*, and the theory of variance of zoning ordinances for hardship in this country, by the eminent authority on police power, Dr. Ernst Freund, appears in the September issue of the *National Municipal Review*, with further comments by the editors of the magazine.

Zoning Map Changes

Edward M. Bassett has written a short article on changes in the zoning map, which appeared in the *New York Evening Post* and in other New York City newspapers, early in September.

Aviation

In the advance program of the meeting of the American Bar Association at Atlantic City last month will be found a report of the Standing Committee on Aeronautical Law. In it are considered such subjects of importance in city planning law as the ownership of the air space above private land and the right to traverse it by plane, including access to airports, the right of local governments to acquire, improve and police land for airports and the right to zone land adjacent to airports.

Essay on Zoning

Of more than usual interest is an extensive paper on zoning written by C. William Brooks, Jr., a member of the staff of the Board of Zoning Appeals of Baltimore. The paper is published in full in the *Baltimore Daily Herald*, August 15, 1931.

For zoning decisions reported in 1930 *in this department, see* THE MUNICIPAL INDEX *for* 1931.

THE TAXPAYER'S DOLLAR

A Monthly Department of Budgeting, Assessment, Taxation, Accounting and Other Phases of Municipal Finance, Conducted by A. E. BUCK, National Institute of Public Administration, New York

Detroit Plans to Avert Financial Crisis

WRITING to *The New York Times* from Detroit, Gladys H. Kelsey, special correspondent, says that that city is gradually working itself out of a financial crisis which is without precedent in this country. While the city is by no means bankrupt, it is very short of funds. Banks are willing to lend the city money, but an act of the recent Michigan legislature stands in the way.

The citizens' finance committee (the so-called Stone committee), organized early in 1930, has submitted certain recommendations to the city council aimed to reestablish Detroit's financial integrity. The council has accepted these and the following procedure has become effective:

1. The welfare department, which spent about $14,000,000 during the fiscal year ending June 30, has been told that it may not spend more than $7,000,000 during the current fiscal year. It will be allowed only $400,000 for August and a like amount for September. After that it must submit a program of expenditures for the remaining ten months of the fiscal year, which will be equivalent to a reorganization of the department.

2. The council is cooperating with the mayor and the comptroller in slashing the total budget of $76,000,000 for the current year. The board of education, which is outside the control of the city council, has agreed to reduce its requirements by postponing the building of several new schools.

3. All departments which are running ahead of their allowances are to be reorganized on reduced schedules.

4. The council is to exercise its judgment in levying immediately the special assessments for public improvements already constructed by the city. These amount to about $7,000,000.

5. The council has adopted the policy that as far as practicable no public improvements will be undertaken during the next five years, except when absolutely necessary for the health and safety of the community.

6. There is to be a complete discontinuance of local improvements in those districts which have substantial tax delinquencies of special assessments.

7. The allotment system of budgetary control has been inaugurated.

8. A scheme to expedite the collection of delinquent taxes and to make the collection of current taxes easier is being worked out by the corporation counsel. It has been suggested that the penalties for tax deliquencies be reduced and that the payment of current taxes be permitted in smaller instalments, perhaps monthly. Of the present cash deficit of some $59,000,000, about $11,500,000 is due to delinquent taxes. But bad as this condition may seem, it is reported to be some improvement over the condition of a year ago.

The Detroit Bureau of Governmental Research says that fundamentally the city's condition is sound. But the thing that its officials must worry about now is the deficit for which no taxes have been levied, which may reach $30,000,000 by the end of the next fiscal year. "The city of Detroit is not impoverished or habitually dissolute," concludes the Bureau, "but it has waked up in the back room with a headache and its pocket money gone."

Financial Readjustment of Massachusetts Cities Recommended

THE New Bedford Taxpayers' Association in a recent bulletin suggests needed improvements in the existing system of financial control of cities in Massachusetts. It says that these cities start their fiscal years on December 1 or January 1 "without any plans—no budget—no knowledge of the resources of the year." They run along in a somewhat haphazard way on the previous year's budget, the previous year's personnel and departmental organization. On election years, the beginning of the fiscal year, December 1, comes at the height of a political campaign, which is a very poor time to start an economy program.

Under the existing law the responsible city officials start to prepare the budget after the first of January. This budget is for current expenses only, and usually does not include an estimate of probable income. The law gives the city authorities 120 days to act on the budget, so it may be May 1 before the appropriation ordinance is passed. It is therefore about five months after the beginning of the fiscal year before the city has a financial plan, and then the city authorities do not know what the exact receipts are going to be or the effect of the spending program upon the tax rate. Not until August is the total valuation of all real and personal property subject to local taxation known. At this time in the fiscal year, it is too late to do much about balancing the budget, or making both ends meet.

The Association holds that any procedure which requires the city to borrow money for ten months to carry on its operation is an expensive method for the taxpayer. As an example, New Bedford borrowed in 1928 on temporary loans $6,250,000 and paid interest amounting to $151,169; in 1929 it borrowed $6,000,000, interest cost $194,200; in 1930 $6,600,000, interest $126,755; and in 1931 $6,660,000, interest $156,000. The interest charge for the use of this money amounted to from 50 cents to $1 on the tax rate of the city. Any change in the law which would reduce this charge would benefit the taxpayers in the long run.

The Association makes the following suggestion for meeting this situation:

1. A change in the Massachusetts law with regard to the beginning of the fiscal year so as to make January 1 uniform for all towns and most of the cities, thereby removing the beginning of the fiscal year from the time of political campaigns.

2. Moving the date for fixing the valuation for tax purposes back gradually so that by January 1 the valuation for the coming year will be known.

3. The preparation of a complete budget by January 1, showing both income and outgo of the city.

4. Fixing the tax rate soon after January 1 and making the taxes payable in instalments soon thereafter so that the city would have to borrow little, if any, money on temporary loans.

While the Association thinks it may not be practical to carry out all of these suggestions at once, on account of existing state laws, nevertheless steps can be taken in these directions.

Coral Gables Proposes Refunding Plan Involving Nine Millions

CORAL GABLES, FLA., has worked out a refinancing plan which involves the refunding of $9,000,000 bonded and floating debt by issuing $4,000,000 new class A bonds bearing 6 per cent interest, and $5,000,000 contingent class B bonds, called corporate stock, distributed pro rata to debt holders.

The class A bonds are for 40 years. A sinking fund of $25,000 per year, commencing in the sixth year after the issuance of the bonds, and increasing in the eleventh year to $40,000 per year, is to be applied to the retirement, by purchases of these bonds at a price not exceeding par value. The entire issue of bonds is subject to call for redemption, at par and interest, after 20 years, providing the outstanding corporate stock is retired at the same time.

The $5,000,000 of corporate stock bears 6 per cent, but neither principal nor interest have a maturity date. Provisions are made by which this stock may, upon certain conditions, be received as payment for delinquent taxes and assessments.

The real property assessment, for taxation purposes, will remain the same for the current fiscal year, but beginning with the next fiscal year, there will be a complete reassessment of property on a uniform basis as to land and improvements. It is anticipated that this will result in a slight increase in the valuation

of improvements, a slight decrease in land values in the improved sections, and a marked decrease in the outlying sections.

The city government is required to reduce its budget for operating expenses for the next fiscal year to a figure not to exceed $220,000. This will require drastic reduction, since the budget for these expenses for the current fiscal year is approximately $247,500. If the city increases its budget for operating expenses, in any year, above $220,000, a like increase must be made in its budget for debt service.

A referendum election on this plan will be held during the coming fall. It is anticipated that the voters will authorize the issuance of the proposed refunding bonds and corporate stock.

Tax Collecting Procedure for Hamilton County, Ohio, Prescribed

THE Cincinnati Bureau of Governmental Research has issued a mimeographed bulletin of about 60 pages prescribing a procedure for the billing, collection and settlement of taxes for Hamilton County. The recommendations which go into this bulletin are the results of a survey and study extending over about two years.

The Bureau describes the present system in the offices of the county auditor and the county treasurer and points out its weaknesses as follows:

WEAKNESSES OF THE PRESENT SYSTEM

1. All addresses and property descriptions are typed, resulting in numerous typographical errors.

2. No permanent tax roll is maintained. A new duplicate (of which three copies are made) is copied from the revised previous year's duplicate.

3. Special assessments are obtained from several sources and posted to the duplicate, involving a stupendous amount of detail in assembling the data required for the tax duplicate.

4. All tax items are posted by hand and totaled on listing machines.

5. The treasurer is required to prepare his bills on typewriters, copying from the duplicate.

6. There is no accurate control on all delinquents.

7. The present form of the tax duplicate is not designed to serve as a compact taxpayers' ledger.

8. As the present duplicate does not carry individual totals for each account, the difficulty in balancing the books which comprise the duplicate is considerably enhanced.

9. Months are required for the preparation of the duplicate and bills, and the setting in of the taxes creates a peak load so that tax bills cannot be mailed when due.

10. The process of distributing taxes for settlement purposes, under the manual, requires the efforts of a large staff for a period of time.

MECHANICAL EQUIPMENT RECOMMENDED

The Bureau believes the task of billing and accounting for taxes can be simplified by the use of mechanical equipment, operated with a smaller office staff, avoiding peak load periods, with the result that the cost of operation for both the county auditor and the county treasurer will be reduced. The recommendations of the Bureau as to the use of mechanical equipment are as follows:

1. The installation of addressing machine equipment will give a permanent record of each taxpayer and property description. It will always address the data required for the duplicate and bills in a neat and accurate manner.

2. A permanent tax roll, on loose leaf forms, describing each parcel of land and filed in alphabetical order by taxpayers (as required by Ohio statutes), will allow the flexibility necessary to assure a practical up-to-date tax roll.

3. The tax roll record sheet will include all the unbilled special assessment instalments for each account, thus expediting the compilation of data for the new duplicate and bills.

4. Mechanical equipment will post all tax items to the duplicate and accumulate totals for controlling purposes.

5. The bills can be completed by the same means, thus balancing with the amounts of the controls.

6. Controls will be established accurately with this equipment and balanced on the new duplicate.

7. A revised form of tax duplicate, in collaboration with mechanical equipment, will give a complete and accurate printed record of each account.

8. Individual totals will be noted for each account, facilitating the closing of the duplicate.

9. Mechanical means offer the only fast and accurate method of preparing the tax duplicate and bills. Addressing equipment can be used for the taxpayer's account and property description, and either billing or tabulating machines for the posting of the amounts.

10. Recently perfected equipment is available which prints the amounts on the duplicate and completes the bills in the same manner, thus assuring complete harmony between the two records; and, as collections are received, will permit of the balancing of cash, printing of remittance sheets, and the distribution of taxes into the necessary divisions, in a minimum period of time with no peak load whatever.

Hinton, W. Va., Makes Progress in Budgeting

HUME K. NOWLAN, City Manager of Hinton, W. Va., isued on August 3 a mimeographed statement, addressed to the city council, which recounts the budgetary progress recently made in that city. It is noteworthy as an example of what can be done in the way of financial planning and control in a small city. (Hinton, according to the 1930 census, has 6,654 inhabitants.)

The method of budgetary control deserves special mention in this connection. Mr. Nowlan explains his system of allotments as follows:

"Since we cannot, as some householders do, have a number of envelopes in which to place the monthly or weekly allotments of small change for each item of expense, we instead set up a budgetary-control ledger with machine-posted sheets, indexed by legendary symbols, for each item of the budget. The total appropriated for each budget entry is then split into time-period allotments, the number being twelve, with each one representing a specific month in the fiscal year and the amount set aside coinciding with the work program for the same period.

"Because these splits are based on a definite work program, the twelve allowances are not equal, for the simple reason that more money must be provided, as an example, for street repairs during the summer months than is reserved for the same work during the winter. But flexibility must be provided for, even in these time-period splits, because emergencies are continuously arising which could not be cared for if the budget were an inflexible instrument. To obtain this effectiveness, a system of transferable balances is practiced, so that unencumbered sums are assigned to over-expended appropriations without disturbing the budget balance itself."

General Property Tax Delinquency Increases in St. Louis

A RECENT statement issued by the St. Louis Bureau of Municipal Research shows that the total general property tax delinquency in that city on March 1, 1931, amounted to $10,871,180, or 30 per cent of the current levy. While this delinquency has been accumulating over a number of years, more than half of it is attributable to the current year. The amount of delinquent taxes in each year has gradually gone up during the past ten years from 8 per cent to 15.6 per cent of the annual levy, or from $1,800,000 to $5,600,000.

The Bureau calls this an "alarming situation." It adds that the "steady upward surge of tax delinquencies during the past decade shows clearly that no effective efforts have been made to stem the tide."

The Bureau believes that "with recurring annual deficits in the city's general fund, and with the increased demands on the city's treasury for unemployment relief next winter, the city of St. Louis should use every effort to collect the taxes due it." The Bureau insists that new taxes should not be imposed so long as these delinquencies are carried. "If all taxes in St. Louis were collected promptly," says the Bureau, "the city's deficit would be wiped out, its important needs could be met, and it might even have a sizeable surplus in its treasury at the end of the fiscal year."

The Municipal Bond Market

The Problem of Borrowing in a Period of Depression

By **SANDERS SHANKS, JR.**
Editor, *The Bond Buyer*

THE sale by the state of New York on September 15 of $40,000,000 one- to fifty-year bonds at a price which shows the state a net interest rate of less than 3¼ per cent. represents a new high for state and municipal bond prices. Unfortunately, however, correspondingly fancy prices are not being offered for the bulk of the obligations offered by states, counties, cities, towns and other municipal corporations. The willingness of investors to purchase New York State bonds to yield 3¼ per cent, with countless excellent securities of less prominent borrowers going begging on far more attractive terms, merely reflects the almost complete loss of confidence which is today the outstanding feature of a severely depressed financial and business world.

Municipal officers are probably surprised at the exhaustive inquiries being made these days by bond buyers with respect to budgets, tax delinquencies, condition of sinking-funds, etc.

A certain bureau of municipal financial information has been urged by important dealer and investor interests to undertake the collection of financial data from cities such as has never before been considered necessary in the evaluation of municipal credit ratings. While it is not yet apparent to the writer that the apprehensions of municipal bond investors are well-founded, it is nevertheless a fact that cities which desire to maintain their credit must be prepared to furnish the financial community with much more exhaustive and intelligently presented fiscal reports than have ever before been sought.

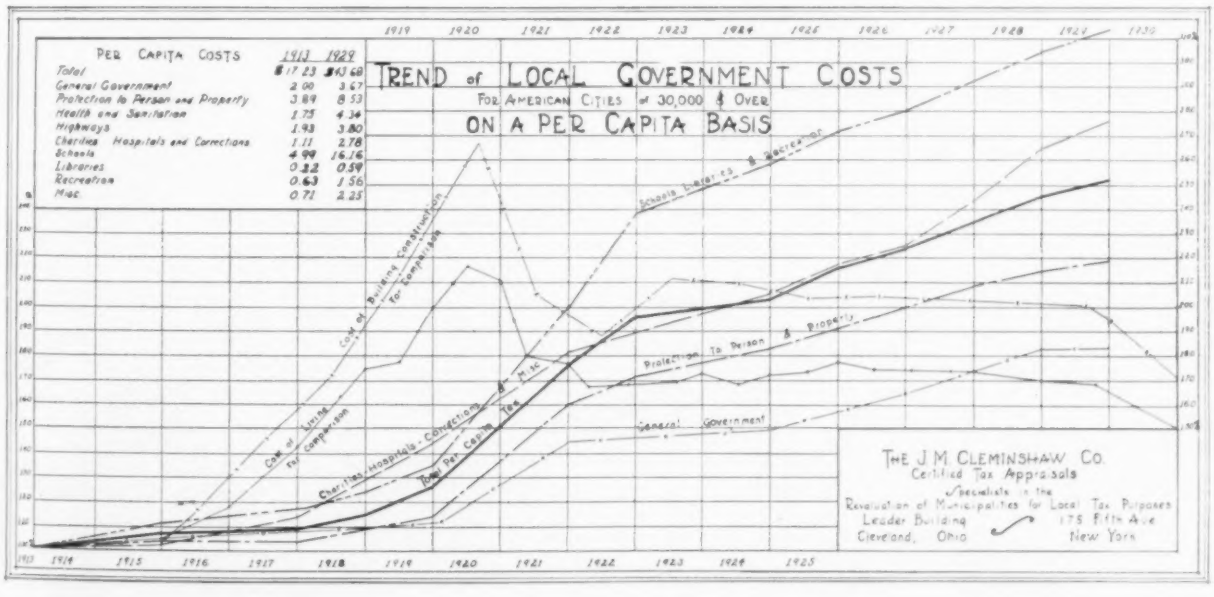
Particularly in demand among bond buyers at this time is a comparative statement reflecting the extent to which percentage of tax delinquency has increased over earlier normal years. And where this exhibit indicates that more than a nominal shrinkage in collections has taken place, assurances that steps are being taken to avoid accumulating deficits or impairment of bond sinking-funds are being demanded before bankers will bid for new bond issues or recommend investment therein.

The situation confronting municipalities with respect to debt-making is a curious one. Investors, on the one hand, are demanding rigid economy, while the plea for relief for the unemployed becomes daily more urgent and, in so many cases, means either increased current tax rates or new bond issues. During the eight months of this year ended August 31 (at the bottom of one of the greatest depressions in the history of the country) state and municipal bond issues sold exceeded a billion dollars.

The following representative list of sales of state and municipal issues indicates the current level of municipal bond prices:

Amount	*Municipality*	*Rate (%)*	*Maturity*	*Net Basis (%)*
$75,000	Attleboro, Mass.	3½	1-10-yr. (ser.)	3.21
75,000	Racine, Wis.	4½	3-yr. (avg.)	3.26
9,000	Tippecanoe Co., Ind.	4½	11 2/3-yr. (avg.)	3.34
2,210,000	Buffalo, N. Y.	3.40	10-yr. (avg.)	3.42
20,000,000	New Jersey	3⅜	21 2/3-yr. (avg.)	3.55
1,000,000	Kansas City, Mo.	4	26-yr. (avg.)	3.65
10,000	Huntington Co., Ind.	4½	5¾-yr. (avg.)	3.78
15,000	Black Hawk Co., Ia.	4	15 2/3-13 (opt.-avg.)	3.89
22,000	Franklin Tp., Pa.	4½	7-yr. avg.)	4.03
105,000	Chaffee Co., Colo.	4½	11-yr. (avg.)	4.25
1,792,000	Fort Worth, Texas	4½	11 5/6-yr. (avg.)	4.38
65,000	Converse Co., Wyo.	4¾	1-15-yr (ser.)	4.47
246,000	Forsyth Co., N. C.	4¾	12⅝-yr. (avg.)	4.66
110,000	Tangipahoa Par., La.	5	12 1/6-yr. (avg.)	4.93
175,000	Gadsden, Ala.	5½	17½-yr. (avg.)	5.61

Percentage Increase in Per Capita Costs of Local Government


PER CAPITA COSTS 1913 1929
Total $17.23 $43.68
General Government 2.00 3.67
Protection to Person and Property 3.89 8.53
Health and Sanitation 1.75 4.34
Highways 1.93 3.80
Charities Hospitals and Corrections 1.11 2.78
Schools 4.99 16.16
Libraries 0.32 0.59
Recreation 0.63 1.56
Misc. 0.71 2.25
TREND of LOCAL GOVERNMENT COSTS
FOR AMERICAN CITIES of 30,000 & OVER
ON A PER CAPITA BASIS
Schools Libraries & Recreation
Cost of Building Construction for Comparison
Cost of Living for Comparison
Charities Hospitals Corrections & Misc.
Total Per Capita Tax
Protection To Person & Property
General Government
THE J. M. CLEMINSHAW CO.
Certified Tax Appraisals
Specialists in the Revaluation of Municipalities for Local Tax Purposes
Leader Building Cleveland, Ohio
175 Fifth Ave. New York

THE accompanying chart showing the percentage of increase from 1913 to 1929 in the cost of the various major departments of local government for United States cities of 30,000 and over, has been developed by the J. M. Cleminshaw Co. from Financial Statistics of Cities as furnished by the Bureau of the Census.

It is interesting to note that the total per capita cost for 1929 was over two and one-half times that of 1913—a jump from $17.23 to $43.68.

The cost of living and construction curves, based on recent statistics, shows a decided downward trend which the compilers of the chart believe can with a fair degree of accuracy be projected to the middle of 1931.

One of the major reasons for our increasing taxes, in Mr. Cleminshaw's opinion, is too much overlapping of taxing districts and too much duplication of effort. Other reasons are obvious to most governmental officials, and it should please them to note that the cost-of-administration curve is the lowest of the general divisions.

Water Rates and Regulations

Part VI

Water-Meter Rates

Hydrant Rentals and Sprinkler Charges

Regulations Covering Taps and the Installation of Services

Coral Gables, Fla.—5,697

Water distributed by the Consumers Water Co. is furnished by the city of Coral Gables. A surcharge of 10 per cent of the total bill is added to all bills collected by the company to reimburse the city for the operation of the city's treating plant.

The water rates are as follows:

Cubic Feet per Month	Per 100 Cubic Feet
100 to 3,000	16c
3,200 to 12,000	15c
13,900 to 30,000	13c
35,500 to 60,000	11c
66,000 to 75,000	10c
Over 93,800	8c

Intermediate consumption not covered by the above steps is billed at the amount of the maximum bill under the next higher rate. The monthly minimum bill is $1.00 net. Bills are rendered at monthly intervals and are due and payable upon presentation.

A rate of $12.50 per year per inch demand of service line is charged for sprinkling and providing fire service connections.

Services are installed without cost to the consumer if the annual revenue equals or exceeds 50 per cent of the cost of its installation.

Portland, Maine

The Portland Water District, which serves several towns in Maine, has a variety of rate schedules.

All water supplies in the Scarboro, Cape Elizabeth, Cumberland and Falmouth Division of the Portland Water District, are subject to the following ready-to-serve charges:

Size of Meter	Per Quarter
5/8"	$1 25
3/4"	2 00
1"	3 00
1 1/2"	5 00
2"	7 50
3"	15 00
4"	30 00
6"	60 00

In addition, the following water rates are charged:

Cubic Feet per Quarter	Per 100 Cubic Feet
First 6,000	20c
Next 6,000	12c
" 6,000	10c
First 30,000	14c
Next 30,000	12c
" 30,000	10c
Over 90,000	7c

When the consumption exceeds 18,000 cubic feet per quarter the following rates apply:

Bills are payable on the first days of January, April, July and October for the preceding three months. A 5 per cent discount is allowed on bills paid within 15 days of date rendered.

For summer residents and those who use water for a part of the year only, the ready-to-serve charges are:

Size of Meter	Per Year
5/8"	$5 00
3/4"	8 00
1"	12 00
1 1/2"	20 00
2"	30 00

The additional water rates are:

Cubic Feet per Season	Per 100 Cubic Feet
First 12,000	20c
Next 12,000	12c
" 12,000	10c

When consumption exceeds 36,000 cubic feet per season, the rates are:

	Per 100 Cubic Feet
First 60,000	14c
Next 60,000	12c
" 60,000	10c
Over 180,000	7c

Water for season services will be furnished from May 1 to November 1 only. A 5 per cent discount is allowed on bills paid within 15 days.

For service in the Prout's Neck and Higgins Beach Division, the ready-to-serve charges are the same as the summer rates above, but the water rate is 40 cents per 100 cubic feet. Water is furnished from May 1 to November 1 only, and bills are subject to 5 per cent discount if paid within 15 days.

All water supplied in the town of Cape Elizabeth to consumers located in the territory south of the southerly boundary of Shore Acres and known as the Two Lights Division of the Portland Water District, is served through surface pipes. The ready-to-serve charges are as follows:

Size of Meter	Per Season
5/8"	$15 00
3/4"	18 00
1"	22 00
1 1/2"	30 00
2"	40 00

The charge for water consumed is 40 cents per 100 cubic feet.

A 5/8-inch meter is installed on each 3/4-inch service and a 3/4-inch meter on each 1-inch service. On larger services the size of the meter is determined by the district, but is never larger than the service to be metered. One meter of suitable size is furnished and maintained by the Water District for each connection with the street main.

Water will be supplied for fire protection on private premises at the rate of $30.00 each per year for private hydrants with 6-inch connection or larger, and $20.00 each per year for smaller connections. For each service entering a building for the supply of standpipes or sprinklers, an annual rental is charged as follows:

Size of Service	Per Year
2"	$7 50
4"	15 00
6"	30 00
8"	60 00

One cent additional is charged for each sprinkler head.

Service pipes will be provided and maintained by the District from the main to the street line. Every service pipe must be provided with a stop and waste cock on the inside of the cellar or foundation wall.

Jackson, Miss.—48,282

Cubic Feet per Month	Per 100 Cubic Feet	Total Bill
First 1,000	20c	$2 00
Next 1,000	16c	3 60
" 1,000	14c	5 00
" 1,000	13c	6 30
" 1,000	12c	7 50
" 5,000	11c	13 00
" 10,000	10c	23 00

Minimum charge $1 per month.

There is no charge for hydrant rentals or sprinkler services for fire protection.

A charge of $15 is made for the installation of a 3/4-inch service line to the curb, $20 for a 1-inch connection, and cost plus 10 per cent for all larger services.

Natchez, Miss. 13,422

Cubic Feet per Month	Per 1,000 Cubic Feet
1 to 4,000	$4 50
4,000 to 8,000	3 93¾
8,000 to 12,000	3 37½
12,000 to 20,000	2 81¼
20,000 to 40,000	2 25
40,000 to 60,000	1 68¾
60,000 to 80,000	1 27½
Over 80,000	1 12½

The minimum charge is 75 cents per month, and a discount of 10 per cent will be allowed on all bills of $1 or more

when paid by the 10th of the month. Accounts unpaid after 30 days have the supply shut off and are subject to a reconnection charge of $1 before resumption of service.

There is a hydrant rental of $50 each per year, payable quarterly in advance, less 10 per cent if paid by the 10th of the month. Most services of this kind are metered and adjustment is made for fires.

The charges for sprinklers are $50 for a 4-inch connection, $66.66 for a 6-inch connection, and $75 for an 8-inch connection. No connections over 8 inches are allowed. These charges are also subject to the 10 per cent discount, and are not metered, the consumer being privileged to use any necessary quantity for extinguishment of fires with no extra charge.

Special rates are made for combination hydrant and sprinkler, hydrant and riser, or sprinkler and riser connections, with all services of this kind metered. The 10 per cent discount applies, and adjustments are made for water used in quenching fires.

All connections are made by the Water Works employees from the main to the property line, where main is available on the streets. Distance runs of small service pipe where a main is not available on the adjacent street are paid for by the consumer and installed from the waterworks connection to the consumer's premises.

Fire service connections are installed by water-works employees to the property line at cost plus 10 per cent for labor and materials. Where desired by the owner, the water works will lay fire protection lines inside premises at cost plus 10 per cent for labor and materials. No sprinkler or other devices will be installed by the company.

The following charges apply to connections from the main to the property line where a main is available, including meter and setting:

¾"	$10 00
1"	15 00
1¼" and 1½"	20 00
2"	32 50

Larger connections are made at cost plus 10 per cent for labor and materials, plus interest on the meter investment and depreciation.

Canton, Miss. —1,725

Cubic Feet per Month		Per 100 Cubic Feet	Total Bill
First	1,000	20c	$2 00
Second	1,000	16c	3 60
Third	1,000	14c	5 00
Fourth	1,000	13c	6 30
Fifth	1,000	12c	7 50
Second	5,000	11c	13 00
Second	10,000	10c	23 00
Third	10,000	9c	32 00
Fourth	10,000	8c	40 00
Fifth	10,000	7c	47 00
Second	50,000	6½c	79 50
Second	100,000	6c	139 50

Minimum charge of 50 cents per month for services up to 1-inch, larger services requiring a higher minimum charge.

The Canton Electric Light and Water Works, a municipal plant, is credited with $25 per hydrant per year, but this is not actually collected.

Sprinkler connections are billed at 2½ cents for each sprinkler head. Private fire services carry a minimum charge of $10 per month. All are 6-inch connections and metered. All water used is billed at regular rates.

Columbia, Mo. —14,967

Cubic Feet per Month		Per 100 Cubic Feet
First	5,000	30c
Next	15,000	27c
Over	20,000	25c

Minimum charge 60 cents per month.

There are about 20 sprinkler systems in Columbia. The City Water and Light Department installs the main into the building at the cost of material and labor. A minimum of $1.50 per month is charged on all sprinkler service.

The city installs and furnishes all meters and pipes to the parking strip, charging $5 for services less than 1-inch, $7.50 for 1-inch and $10 for 1½-inch services. This charge includes tapping the main, the meter, meter tiles, etc., the equipment remaining the property of the city.

All fire hydrants and water are furnished free to the city.

Dexter, Mo. —2,714

Gallons per Month		
First	2,000	$1 00 minimum per 1,000 Gallons
Next	3,000	25c
5,000 to	300,000	15c
Over	300,000	8c

All installations are made at the expense of the customer, the customer furnishing all material. After the line is installed, the city maintains it up to the curb.

The city has 50 fire hydrants for which no charge is made by the Water Department.

Bills are due on or before the 20th of each month. If not paid when due, the water will be turned off and a charge of $1 made for re-connection.

Malta, Mont. —1,342

Gallons per Month		
First	1,000	$1.50 minimum
		Per 1,000 Gallons
Next	2,000	50c
"	3,000	30c
Excess		5c

No charge is made for fire hydrants. Malta has no sprinkler systems.

The city furnishes the corporation cock and makes taps free of charge. The city also turns water off and on at the curb cock without charge.

Fremont, Nebr. —11,407

This city has a municipal plant, water being obtained from wells. An underground lake, containing pure water filtered through natural sand 70 feet below the surface, supplies the wells. The system is 100 per cent metered, the rates being as follows:

Cubic Feet per Month		Per 100 Cubic Feet
First	3,500	15c
Next	3,500	12c
"	13,000	9c
"	13,500	7½c

Minimum bill 55 cents per month. Bills are subject to 10 per cent discount if paid on the 10th of the month.

The city has 218 hydrants, for which it pays a total of $11,600 per year.

Taps are made by the city at a charge of $2 each.

Services are installed by owners of property at their own expense from the tap. Stop boxes are installed at the curb.

Grand Island, Nebr. —18,011

Cubic Feet per Month		Per 100 Cubic Feet
First	1,000	15c
Next	3,000	12c
"	6,000	9c
"	90,000	8c
"	100,000	7c
Over	200,000	6c

Minimum, $6.00 per year.

The Water, Light, Ice and Sewer Department makes a charge of $23.50 per year per hydrant. The minimum charge for private sprinkler service is $25 per year, which includes a system having up to 1,500 sprinkler heads. For additional heads, the charge is 1½ cents each.

The Department makes the following charges for making taps and installing services complete to the curb line:

¾"	$25 00
¾"	30 00
1"	42 50
1½"	55 00
2"	70 00

Hastings, Nebr. —15,490

Cubic Feet per Quarter		Per 100 Cubic Feet
First	5,000	15c
Next	5,000	13c
Over	10,000	10c

The city pays the Water Department a tax levy of approximately $10,000 per year, which covers all charges for the repair and maintenance of fire hydrants, water service for fires, sewer flushing, parks and all public purposes. The number of hydrants in use is 315.

There are no charges for water service to private fire service connections or connections to sprinkler systems.

All taps are made by the City Water Department, and the property owner makes the connection from the corporation cock to the building, furnishing all material and labor.

Claremont, N. H. —12,377

The meter rate for domestic purposes is 15 cents per 100 cubic feet, with a minimum of $12 per year.

The Water Department will furnish and lay a service pipe from the main to the property line, placing a stop at the curb line. Every service pipe must be provided with a stop and waste cock on the inside of the cellar or foundation wall. The Department will furnish one meter to a service pipe and set it free of charge.

(To be continued)

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MUNICIPAL AND CIVIC PUBLICATIONS

Prices quoted do not include postage, unless so stated.

Municipal Government

A Short Course in American City Government.—By Austin F. Macdonald, Professor of Political Science, University of California. Thos. Y. Crowell Co., New York. 1931. 480 *pp.* $2.75.

In this meaty volume Professor Macdonald reprints the first 19 chapters of his "American City Government and Administration," published two years ago. In this shorter form, with the more technical chapters omitted, the book is suited to a one-term college course in the subject, and is also a handy general reference work for those active in city government, which is described and discussed in a simple, matter-of-fact manner.

A Government Yearbook

Minnesota Year Book. 1931.—*League of Minnesota Municipalities.* 390 *pp.* $5.00 *from* THE AMERICAN CITY.

Government in Minnesota, its organization and administration, state, county, and local, are recorded in this second annual yearbook, which is a complete, well-edited, illustrated and indexed volume. The section proper devoted to city, village, and township government contains accounts of municipalities and townships and their operations under different general and special laws now in effect, a directory of municipal officials, statistics on recreation in Minnesota cities and villages, and a digest of all acts passed by the 1931 State Legislature in the interest of municipalities.

Special sections are devoted to taxation and finance and to the public utilities services to municipalities, and interesting data are also given on such matters as fire insurance ratings of the municipalities of the state, on election procedure, the regulation of business, professions and occupations.

Regional Planning

The New Jersey Regional Planning Commission has issued the second number, dated September, 1931, of its 4-page paper, *Regional Government*, including an article on "Regional Government Needed to Avert Blighted Suburbs," by Harold W. Dodds, Editor, *National Municipal Review*. The Commission also has available for free distribution the following publications: "Annual Report of Regional Planning Commission for 1931"; "Report of Meadows Reclamation Commission, 1931"; "Reports of North Jersey Transit Commission, 1926, 1929, 1930, 1931"; "Map of Proposed North Jersey Rapid Transit System"; "The Third American City," by Amory H. Bradford; "North Jersey's Regional Problem," by Spaulding Frazer; "Regional Government Bill, introduced in Legislature, 1931." (Apply to the Commission, 1726 Lefcourt Bldg., Newark, N. J.)

Recreation Administration

"Standards of Play and Recreation Administration," a report of the Committee on Play and Recreation Administration of the National Municipal League, prepared by the chairman, Professor Jay B. Nash of New York University, appeared as a supplement to the *National Municipal Review* for July, and is now available in pamphlet form. The committee suggests a clear-cut and definite division of responsibility between the schools and the municipal government, with the school program providing recreation on a year-round basis for those of school age, and the municipal government responsible for providing recreation for adults. 22 pp. 25c ($15.00 per hundred). (Apply to the League, 261 Broadway, New York.)

Motor Vehicle Law

The "Illinois Motor Vehicle Law in force July 1, 1931," has been compiled by William J. Stratton, Secretary of State, and is published in a small pocket-size handbook. 79 pp. (Apply to the Secretary of State, Springfield, Ill.)

Building and Loan

History of Building and Loan in the United States.—H. Morton Bodfish, Editor in Chief. United States Building and Loan League, Chicago, Ill. 1931. 798 *pp.*

A hundred years are here passed in review in the light of their contribution to cooperative finance in this country. The account is carried along in concise and readable style by numerous contributors, all of whom are prominently identified with the subject. Federal legislation and prominent legal decisions affecting building and loan associations are reviewed, and the literature and the educational organization which the movement has developed are discussed. Part I ends with a forecast of the future of building and loan in the United States. Part II is devoted to building and loan development in the several states.

Police Records

The "Manual of Police Records as Installed in Pasadena, Calif., and Applicable to Cities of 25,000 to 150,000 Population," prepared by the research committee of the International City Managers' Association at the request of City Manager Orbison and Police Chief Kelly of Pasadena, is being distributed to police chiefs and other city officials throughout the country for purposes of illustrating how a model police records system operates. Although designed for Pasadena (population 76,000), it is suitable for nearly all cities in the country with populations of 25,000 to 150,000. 37 pp. Free to city officials. (Apply to Donald C. Stone, Research Director, International City Managers' Association, 923 E. 60th St., Chicago, Ill.)

City Manager Plan

Twenty-four questions about the manager plan are raised and answered briefly in a small 8-page leaflet, "Answers to Your Questions," prepared by the National Municipal League. $3.00 per 100. (Apply to the League, 261 Broadway, New York.)

Taxation

The Taxpayer, "A House Organ for the Stockholder in the American Government," is a new periodical. Volume 1, Number 1, dated October, 1931, contains a section of "Official Views on Taxation" excerpted from public utterances of the President and of numerous governors. In addition to editorials, articles, and other timely matter, there is a Taxpayer's Forum department. 20 pp. 25c per copy. (Apply to Anton S. Rosing, Editor and Publisher, Middletown, Ohio.)

Billboards

"Billboards and Aesthetic Legislation—New Applications of the Police Power," by Lucius H. Cannon, Librarian, Municipal Reference Library, St. Louis, Mo., with an introduction by Harland Bartholomew, Engineer, City Plan Commission, St. Louis, is a 45-page bulletin, unfortunately published for the most part in very small type, which compiles data about the regulation of outdoor advertising in certain cities and states and in Great Britain. 40 pp., including bibliographies. 25c. (Apply to the Municipal Reference Library, 408 City Hall, St. Louis, Mo.)

A Billboard Study

"The Massachusetts Billboard Cases," an article by Albert S. Bard, Counsel to the National Council for the Protection of Roadside Beauty, is reprinted from the *National Municipal Review* for August, and discusses the findings of the master appointed by the Supreme Court of Massachusetts to take the evidence in the proceeding in which fifteen billboard cases were consolidated. 10 pp. (Apply to Mr. Bard, 25 Broad St., New York.)

An Engineering Biography

Who's Who in Engineering: A Biographical Dictionary of the Engineering Profession.—Winfield Scott Downs, Editor, Lewis Historical Publishing Company, Inc., New York. 1931, *third edition.* 1,536 *pp.* $10.00.

The publishers have performed an outstanding service for the engineering profession in the publication of this third volume of Who's Who in Engineering. By establishing an advisory committee and a definite set of qualifications for engineers who would be included in the volume, it is now possible for any one to quickly establish the position of an engineer and his experience through the brief biographical sketches. A geographical index arranged by states and cities also adds to the value and convenience of the volume. The first edition of this book contained biographical sketches of 10,000 engineers, the second, 18,500, and the third edition contains 12,000.

Unemployment

Unemployment Problems in 1931.—*International Labor Office (League of Nations). Distributed in the United States by the World Peace Foundation.* 280 *pp.* $1.50 *from* THE AMERICAN CITY.

No. 16 of Series C of the Studies and Reports of the International Labor Office issued under the above title, has been prepared with the collaboration of Professors Ansiaux, Cole, Hahn and Hersch. It is in seven sections: Unemployment Problems in 1931 (Extracts from the Report of the Labor Office Director); Unemployment and Monetary Fluctuations; Inequalities in the International Distribution of Capital as a Cause of Unemployment; Disturbances in International Trade and Their Effects on Unemployment; Population and Unemployment; Effects of Rationalization on Unemployment; and Wages and Unemployment. The sections are mutually complementary and form a complete presentation of one of the most outstanding of present-day problems.

Water Pollution

The United States Public Health Service has issued "Detailed Instructions for the Performance of the Dissolved Oxygen and Biochemical Oxygen Demand Tests," by Emery J. Theriault, Chemist, United States Public Health Service (Supplement No. 90 to the Public Health Reports), superseding earlier instructions published by the Public Health Service. 34 pp. 10c. (Apply to the Superintendent of Documents, Washington, D. C.)

Camp Sanitation

"Camp Sanitation," a booklet of 71 pages, has been prepared by the Division of Sanitation of the New York State Department of Health. Subjects covered include the selection of camp sites, insect control, equipment, water and milk supply, sewage and waste disposal, garbage disposal, and the supervision of camps, swimming pools, etc. (Apply to the State Department of Health, Albany, N. Y.)

Road Building

The American Road Builders' Association has available for distribution the following 1931 bulletins: "Standardization of Weighing Devices for Concrete Aggregate" and "Standardization of Steel Side Forms for Concrete Pavements" (No. 15); "Central and Truck Mixed Concrete" (No. 16); "Grading Methods and Grading Equipment—Construction and Compaction of Embankments" (No. 17); "Highway Location" (No. 18); "Highway Guard Rail" (No. 19); "Snow Removal and Equipment," "Survey of Needs for and Availability of Maintenance Equipment" and Highway Maintenance by Contract" (No. 20); "Standardization of Methods for Purchasing Equipment"; "Motor Freight"; "Railway Grade Crossings and Highway Intersections" and "Traffic" (No. 23); "Highway Finance and Administration" and "Highway Building with Particular Reference to the Federal Employment Program" (No. 24). (Apply to the Association, Suite 938, National Press Bldg., Washington, D. C.)

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Home Management

The Home and the Child.—The Century Co., New York. 1931. 185 *pp.* $2.00 *from* THE AMERICAN CITY.

The White House Conference on Child Health and Protection offers in this subcommittee report a study of home management as it relates to the health, growth, and welfare of the family, especially the child. There is a substantial section on housing with reference to new dwellings, improvements, and changes to affect health, esthetic and physical factors; also a housing bibliography. Other sections are devoted to Furnishings and Equipment; Management of Home Activities; Management of Income; and Children's Clothing. Each section has recommendations for further research. The Conference, and this particular committee, are concerned with the changing and shrinking home, its effect upon the welfare of children, and the extent to which it may be made to function as an environment for the development of normal personalities, as did the quieter, more stable, more spacious home of the past.

Reading List

"National Parks, National Monuments and National Forests—A Selective List of Books and Articles Compiled by Students of the St. Louis Library School," the July bulletin of the St. Louis Public Library, is an annotated reading list "for the tourist or the reader interested in the marvels of our own country." 27 pp. (Apply to the St. Louis Public Library, St. Louis, Mo.)

Recreation

An amusingly illustrated pamphlet of 16 pages has been prepared by the Bureau of Crime Prevention of the Police Department of the city of New York, entitled "Recreational Facilities Provided by the City and State Governments and Private Agency." Information is given about music, botanic and zoological gardens, tennis, gymnasia, athletics, golf, swimming, hiking and camping. (Apply to the Bureau of Crime Prevention, Police Dept., New York City.)

Flood Control

Part One, a general summary, of Special Report 2, "Control of Floods on the Passaic River," has been issued by the New Jersey State Water Policy Commission, addressed to the State Legislature. Part Two, containing technical details, will be completed later. Part One is divided into three sections: Hydrology; Control Works; and Benefits. In summarizing, the relative merits of several alternative possibilities are discussed, although no recommendation is made by the Commission as to the advisability of adoption of any plan. 117 pp., plus a number of tables and maps. (Apply to the Commission, 605 Broad St., Newark, N. J.)

Social Survey

Because it was felt that many readers may want the material in the historical and interpretative introduction to the recently published "Bibliography of Social Surveys" and will not need the comprehensive bibliography, a pamphlet has been published by the Russell Sage Foundation reprinting, with changes, the introduction. "The Social Survey—The Idea Defined and Its Development Traced," by Shelby M. Harrison, Director of the Department of Surveys and Exhibits of the Foundation, is now available in a 42-page booklet. 25c. (Apply to the Foundation, 130 E. 22d St., New York.)

City Advertising

Affirmative answers to the questions "Is the expending of money by a City Council for advertising a municipality, expending money for a public purpose?" and "Can a City Council contract with a Chamber of Commerce to do advertising for the city?" were given by the Supreme Court of California in a test case, *Sacramento Chamber of Commerce vs. J. H. Stephens* (City Treasurer, Sacramento). The text of the decision has been reprinted in a 4-page leaflet by the Chamber of Commerce, entitled "Can a City Council Contract with a Chamber of Commerce to Do Advertising for the City." (Apply to the Chamber of Commerce, Sacramento, Calif.)

Model Ordinances

Pennsylvania Borough Ordinances.—By T. F. Chrostwaite. Anthony Printing Co. 398 *pp.; in buckram.* $7 *from* THE AMERICAN CITY.

Ordinances hastily drafted in council often prove unsatisfactory even to the drafters. They sometimes prove unenforceable, and even illegal. The present volume is by the author of "Pennsylvania Borough Law," who is also President of the Pennsylvania Association of Boroughs, and editor of *The Borough Bulletin* and the *Municipal Law Reporter*. It has been compiled to meet the demand of Pennsylvania borough officials for a reliable and comprehensive reference work on this subject. The material is indexed to conform with the arrangement of the Borough Code and of "Pennsylvania Borough Law," and includes all "typical and essential" ordinance forms.

The work has general interest and value for city attorneys and other municipal officials. The ordinance models are based on widely representative material, carefully considered. The compilation as a whole (like all such works) is calculated to play its part towards developing a greater degree of uniformity in the drafting of local legislation, and this will simplify the work of the courts in construing ordinances according to precedent when their legality is under question.

Sewage Treatment

"The "Report of Rees H. Davis, Director of Public Service, Cleveland, Ohio, upon the Treatment of Sewage from the Easterly Sewerage District" is a document of 157 pages and a number of charts and diagrams. It was prepared by George B. Gascoigne, consulting sanitary engineer, Cleveland, Ohio, and consists of three parts: Volume One, a summary of findings and recommendations; Volume Two, detail studies and supporting data from the engineering investigation; Volume Three, the general drawings of the projected plan. (Apply to Mr. Gascoigne, Leader Bldg., Cleveland, Ohio.)

Magistrates' Courts

Magistrates' courts and their predecessors, aldermen's courts, have been a problem in Philadelphia for a century. How the system works, the defects of the machinery, the unsatisfactory results of its operations, and proposals for improvement, are all presented with appropriate historical background in "The Magistrates' Courts of Philadelphia," by Spencer Irvin, of the Philadelphia Bar, a 231-page study made by a special grant from the Thomas Skelton Harrison Foundation. Free. (Apply to the Foundation, 311 S. Juniper St., Philadelphia, Pa.)

Judicial Decisions

The "Judicial Decisions" section of the *National Municipal Review* for September, 1931, has been reprinted in a brochure of 8 pages. It is a review of current decisions relating to municipal corporations, edited by C. W. Tooke, Professor of Law, New York University, and contains a discussion of the "Power of Zoning Boards of Appeals to Grant Variations," by Dr. Ernst Freund. (Apply to New York University Law School, New York.)

Safety Education

The Safety Division of the American Automobile Association has prepared a 20-page illustrated booklet of magazine size on "Safety Education," describing the operation of schoolboy patrols. A smaller pamphlet, also illustrated, on "Uniform Plan for Operation of School Patrols in Minnesota," has been compiled by the Minnesota Department of Highways to facilitate the adoption and operation of school patrols by both town and country schools. The plan is patterned closely after the "Standard Rules for Operation of School Patrols" adopted by the joint committee of the American Automobile Association, the National Safety Council and the National Congress of Parents and Teachers. 15 pp. (Apply for "Safety Education" to the American Automobile Association, Pennsylvania Ave. at 17th St., Washington, D. C.; for "School Patrols in Minnesota," to the Department of Highways, St. Paul, Minn.)

New Delhi

The *Engineering News-Record* for September 10, 1931, contains a 4-page article on "New Delhi —Capital City of India, 1931" (pp. 413-416), describing the official city which was founded in open country in 1913 and was dedicated early in 1931. (Apply to the McGraw-Hill Publishing Co., 10th Ave. and 36th St., New York.)

Other Reports Received

CHICAGO, ILL.—Annual Report, Department of Gas and Electricity. 1930. 59 pp.

LOUISVILLE, KY.—Annual Report, Louisville Water Co. 1930. 89 pp.

MOOSE JAW, SASK.—Financial Statement. 1930. 62 pp.

NEWARK, N. J.—Annual Report of the Auditor of Accounts. 1930. 229 pp.

SEATTLE, WASH.—Annual Report, Department of Lighting. 1930. 61 pp.

Recent City Manager Appointments

CHARLES F. ADAMS was recently appointed City Manager of Ardmore, Okla., to succeed H. H. Johnson, who had been City Manager for the past two years. At the time of his appointment Mr. Adams was Mayor of Ardmore.

J. W. Charleville has resigned the city managership of Glendale, Calif., to become City Manager of Pasadena, Calif., effective September 1. He succeeds R. V. Orbison, who resigned early in August. Mr. Charleville had been City Manager of Glendale since 1926.

Wilbur M. Cotton has been appointed the first City Manager of St. Petersburg, Fla., effective September 10. At the time of his appointment Mr. Cotton was Director of the Dayton Research Association. He already has had ten years' experience, first as City Manager of Edgeworth, Sewickley, Osborne, and Ambridge, Pa., and later of Ashtabula, Ohio.

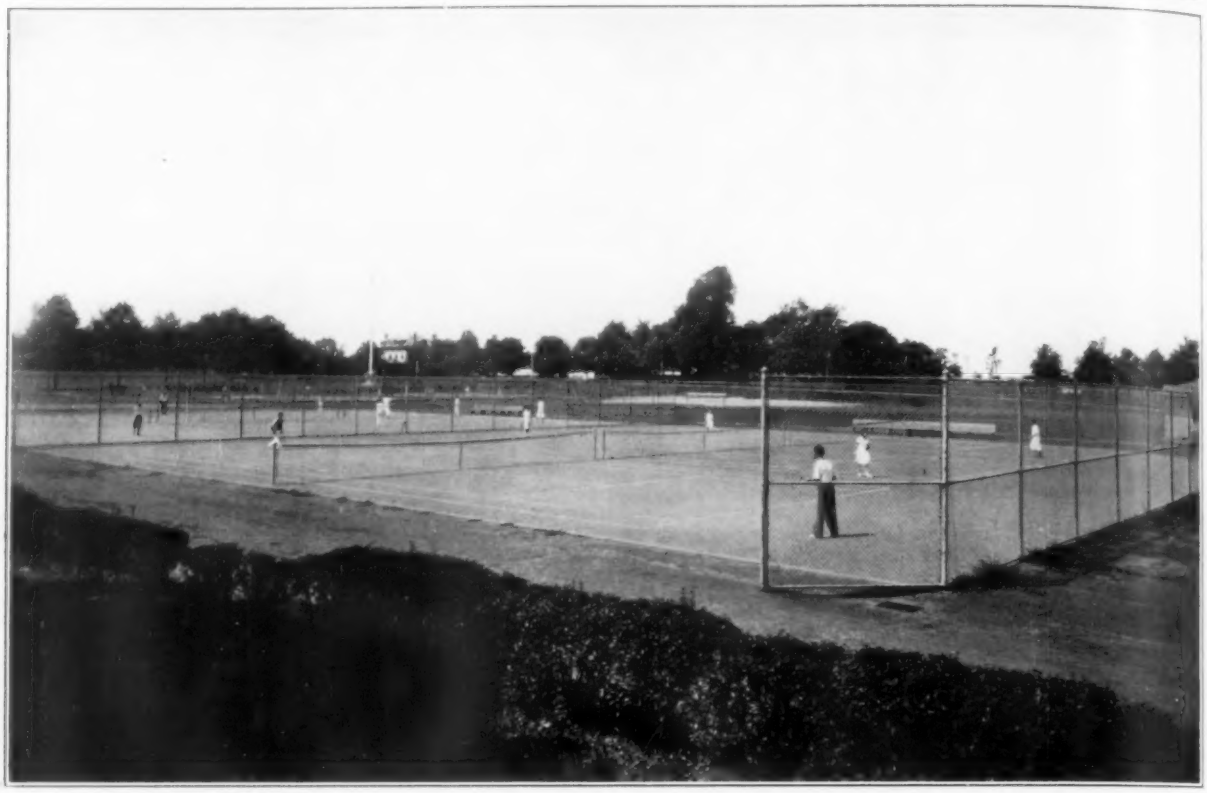
R. N. Dugger held positions with several banks and private organizations from 1911 until February, 1931, when he became clerk and bookkeeper for the city of Fort Meade, Fla. On July 1, he took office as City Manager of that city, to succeed E. F. Mitchell.

Charles Larsen was appointed City Manager of Lakeland, Fla., on September 1, to succeed J. F. Council, who had been City Manager since 1928. Mr. Larsen had been superintendent of the municipal water and light plant for ten years prior to his appointment as City Manager.

E. V. Perry, who was appointed the first City Manager of Appalachia, Va., on September 1, was Director of Public Safety in Huntington, W. Va., 1926-28, and Commissioner of Finance from 1928 to September 1, 1931.

Charles W. Ten Eick was reappointed City Manager of Hollywood, Fla., in September. He was first appointed City Manager in August, 1930, and resigned on August 6 of this year. During the four years prior to 1930, Mr. Ten Eick served successively as Assistant City Engineer, Water Superintendent, and Assistant City Manager.

CLARENCE E. RIDLEY,
Executive Secretary, The International City Managers' Association.



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The Improved Asphalt Pavement

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Central Westphalt Pavement Co.
St. Louis, Mo.

Tenn. Westphalt Co.
Chattanooga, Tenn.

CONVENTIONS—WHEN AND WHERE

(Figures in parentheses following the name of the convention city indicate the estimated attendance, other than local.)

OCTOBER 5-8.—DETROIT, MICH., AND ENVIRONS. (50)
American Civic Association, Inc. Fifth Annual Traveling Meeting. Executive Secretary, Miss Harlean James, Union Trust Building, Washington, D. C.

OCTOBER 5-9.—TORONTO, ONT. (600)
National Recreation Association. Annual Recreation Congress. Secretary of the Recreation Congress Committee, Thomas E. Rivers, 315 Fourth Avenue, New York.

OCTOBER 7-9.—ST. PAUL, MINN. (700)
American Society of Civil Engineers. Fall meeting. Secretary, George T. Seabury, 33 West 39th Street, New York.

OCTOBER 7-10.—LOUISVILLE, KY. (250)
International City Managers' Association. Annual convention. Executive Secretary, Clarence E. Ridley, 923 East 60th Street, Chicago, Ill.

OCTOBER 7-8.—LOWELL, MASS.
Massachusetts Federation of Planning Boards. Annual conference. Secretary, Loring H. Jacobs, 135 Benvenue Street, Wellesley, Mass.

OCTOBER 7-9.—MILWAUKEE, WIS. (200)
Wisconsin Chiefs of Police Association. Annual meeting. Secretary, R. H. McCarty, Police Department, Kaukauna, Wis.

OCTOBER 8-9.—CINCINNATI, OHIO.
American Water Works Association—Central States Section. Annual convention. Secretary, B. J. Lechner, Water Department, Erie, Pa.

OCTOBER 8-9.—SWAMPSCOTT, MASS. (200)
Massachusetts Police Association. Annual convention. Secretary, John H. Shaughnessy, West Newton, Mass.

OCTOBER 8-9.—CAMDEN, N. J. (500)
New Jersey State League of Municipalities. Annual convention. Executive Secretary, Sedley H. Phinney, 34 W. State Street, Trenton, N. J.

OCTOBER 12-13.—MONTEREY, CALIF. (150)
California Sewage Works Association. Annual convention. Secretary, Professor E. Reinke, Life Sciences Building, University of California, Berkeley, Calif.

OCTOBER 12-15.—ST. PETERSBURG, FLA.
International Association of Chiefs of Police. Annual convention. Secretary, George Black, Chief of Police, Wilmington, Del.

OCTOBER 12, WEEK OF.—CHICAGO, ILL. (7,000)
National Safety Council. Annual Congress. Managing Director, W. H. Cameron, 20 North Wacker Drive, Chicago, Ill.

OCTOBER 12-16.—ATLANTA, GA. (450)
National Tax Association. Annual conference. Secretary, W. G. Query, South Carolina Tax Commission, Columbia, S. C.

OCTOBER 12-13.—DEVILS LAKE, N. DAK. (100)
League of North Dakota Municipalities. Annual meeting. Executive Secretary, Myron H. Atkinson, Bismarck, N. Dak.

OCTOBER 13-16.—PITTSBURGH, PA. (500)
Illuminating Engineering Society. Annual convention. General Secretary, E. H. Hobbie, 29 West 39th Street, New York.

OCTOBER 13-14.—AKRON, OHIO. (400)
Ohio Conference on Sewage Treatment. Annual convention. Secretary-Treasurer, G. E. Flower, Superintendent of the Southerly Sewage Plant, Cleveland, Ohio.

OCTOBER 14-17.—HAVANA, CUBA. (1,200)
International Association of Fire Chiefs. Annual convention. Secretary, James J. Mulcahey, Fire Chief, Yonkers, N. Y.

OCTOBER 14-15.—JOPLIN, MO. (150)
League of Missouri Municipalities. Annual convention. Executive Secretary, J. W. Lumpp, 6801 Delmar Boulevard, University City, Mo.

OCTOBER 14-15.—FREMONT, NEBR. (400)
League of Nebraska Municipalities. Annual meeting. Secretary-Treasurer, C. E. Beals, 407 East 12th Street, Crete, Nebr.

OCTOBER 15.—CHICAGO, ILL.
Institute of Traffic Engineers. Annual meeting. Secretary-Treasurer, Hawley S. Simpson, 175 Fifth Avenue, New York.

OCTOBER 15-16.—WINDSOR, ONT. (125)
Ontario Associated Boards of Trade and Chambers of Commerce. Annual meeting. Secretary-Treasurer, T. Marshall, Royal Bank Building, Toronto, Ont.

OCTOBER 18-23.—BALTIMORE, MD. (500)
American Prison Association. Annual Congress. General Secretary, E. R. Cass, 135 East 15th Street, New York.

OCTOBER 18-21.—TOLEDO, OHIO. (325)
National Association of Commercial Organization Secretaries. Annual convention. Secretary-Treasurer, Gerrish Gassaway, Chamber of Commerce, Wilmington, Del.

OCTOBER 19-23.—PITTSBURGH, PA. (200)
American Society of Municipal Engineers. Annual convention. Secretary, C. W. S. Sammelman, 4359 Lindell Boulevard, St. Louis, Mo.

OCTOBER 19-21.—MCPHERSON, KANS. (300)
League of Kansas Municipalities. Annual convention. Executive Secretary, John G. Stutz, Lawrence, Kans.

OCTOBER 19-22.—NEW ORLEANS, LA. (300)
Southwest Water Works Association. Annual convention. Secretary-Treasurer, Lewis A. Quigley, Fort Worth, Texas.

OCTOBER 20-23.—RICHMOND, VA. (200)
National Association of Railroad and Utilities Commissioners. Annual convention. Secretary, James B. Walker, 270 Madison Avenue, New York.

OCTOBER 20-21.—ITHACA, N. Y. (60)
New York State Sewage Works Association. Fall meeting. Secretary-Treasurer, A. S. Bedell, State Department of Health, Albany, N. Y.

OCTOBER 21-23.—DENVER, COLO. (100)
American Water Works Association—Rocky Mountain Section. Annual meeting. Secretary-Treasurer, Dana E. Kepner, 226 Continental Oil Building, Denver, Colo.

OCTOBER 21-23.—ATLANTIC CITY, N. J.
The Pennsylvania Water Works Association. Annual meeting. Secretary, F. S. Purviance, 327 Telegraph Building, Harrisburg, Pa.

OCTOBER 21-22.—NORFOLK, VA. (400)
League of Virginia Municipalities. Annual convention. Executive Secretary, Morton L. Wallerstein, 408 Travelers Building, Richmond, Va.

OCTOBER 22-23.—WAUKEGAN, ILL. (300)
Illinois Municipal League. Annual convention. Secretary, A. D. McLarty, Urbana, Ill.

OCTOBER 22-23.—JEFFERSON CITY, MO. (100)
Missouri Water and Sewerage Conference. Secretary-Treasurer, H. M. Bosch, Jefferson City, Mo.

OCTOBER 26-27.—RACINE, WIS. (125)
American Water Works Association—Wisconsin Section. Annual convention. Secretary, L. A. Smith, Superintendent of Water Works, City Hall, Madison, Wis.

OCTOBER 27-30.—JACKSONVILLE, FLA.
International Association of Municipal Electricians. Annual convention. Secretary, W. H. Harth, Columbia, S. C.

OCTOBER 29-31.—LAWRENCE, KANS. (150)
American Water Works Association—Missouri Valley Section. Annual meeting. Secretary, Earl L. Waterman, University of Iowa, Iowa City, Iowa.

OCTOBER 29-31.—EL PASO, TEXAS.
County Judges and Commissioners of Texas. Annual convention. Secretary, Thomas B. Smiley, Karnes City, Texas.

OCTOBER 29-30.—COLUMBUS, OHIO. (50)
Ohio State Planning Conference. Annual meeting. Secretary, M. D. Downs, Hamilton County Court House, Cincinnati, Ohio.

OCTOBER 29-31.—MCALESTER, OKLA. (200)
Oklahoma Municipal League. Annual convention. Secretary, Roy Eaton, Norman, Okla.

OCTOBER 30.—ST. PAUL, MINN. (40)
American Water Works Association—Minnesota Section. Annual meeting. Secretary-Treasurer, Ronald M. Finch, 240 South Fourth Street, Minneapolis, Minn.

OCTOBER 30-31.—VANCOUVER, WASH., AND PORTLAND, ORE.
Washington Association of Commercial Organization Secretaries. Annual meeting. Manager, Thomas B. Hill, Washington State Chamber of Commerce, Seattle, Wash.

NOVEMBER 2-4.—GREENSBORO, N. C.
American Water Works Association—North Carolina Section. Joint annual meeting with the North Carolina Sewage Works Association. Secretary, Professor H. G. Baity, University of North Carolina, Chapel Hill, N. C.

NOVEMBER 5-7.—FARGO, N. DAK. (50)
North Dakota Water and Sewage Works Conference. Annual meeting. Secretary-Treasurer, A. L. Bavone, Bismarck, N. Dak.

NOVEMBER 9-11.—BUFFALO, N. Y.
National Conference on Government, a combination of the annual meetings of the following organizations: National Municipal League, Secretary, Russell Forbes, 261 Broadway, New York; *Governmental Research Association,* Secretary, Russell Forbes; *National Association of Civic Secretaries,* Secretary, George H. Hallett, Jr., 311 South Juniper Street, Philadelphia, Pa.; *Proportional Representation League,* Executive Secretary, George H. Hallett; *American Legislators' Association,* Director, Hon. Henry W. Toll, Equitable Building, Denver, Colo.

NOVEMBER 9-14.—HOUSTON, TEXAS.
Texas Public Health Association. Ninth Texas Sanitarians' Short School. Secretary, E. G. Eggert, Texas State Board of Health, Austin, Texas.

NOVEMBER 12-14.—AMES, IOWA. (100)
Iowa Sewage Treatment Conference. Secretary-Treasurer, Linden J. Murphy, Municipal Engineer, Iowa State College, Ames, Iowa.

NOVEMBER 18-20.—EDMONTON, ALTA. (250)
Alberta Association of Municipal Districts. Annual convention. Secretary, E. Pinchbeck, Spruce Grove, Alta.

NOVEMBER 30-DECEMBER 4.—CHICAGO, ILL.
American Association of Pools and Beaches, Inc., meeting with the National Association of Amusement Parks. Executive Secretary of the American Association, Lyle L. Jenne, 725 Bulletin Building, Philadelphia, Pa.; Secretary of the National Association, A. R. Hodge, Riverview Park Company, Chicago, Ill.

NOVEMBER 30-DECEMBER 4.—NEW YORK.
American Society of Mechanical Engineers. Annual meeting. Secretary, C. W. Rice, 29 West 39th Street, New York.

DECEMBER 2-5.—WASHINGTON, D. C.
President's Conference on Home Building and Ownership. Executive Secretary, Dr. John M. Gries, Department of Commerce, Washington, D. C.

DECEMBER 8-9.—WASHINGTON, D. C.
National Rivers and Harbors Congress. Annual Congress. Secretary-Treasurer, S. A. Thompson, 824 Colorado Building, Washington, D. C.

JANUARY 9-13.—DETROIT, MICH. (25,000)
American Road Builders' Association, including the following divisions: City Officials', County Highway Officials', Manufacturers' and Pan-American. Annual convention and Road Show. Secretary and Engineer-Executive, Charles M. Upham, National Press Building, Washington, D. C.

JANUARY 25-29.—MILWAUKEE, WIS.
American Institute of Electrical Engineers. Annual winter convention. National Secretary, F. L. Hutchinson, 33 West 39th Street, New York.

MAY 2-6.—MEMPHIS, TENN. (1,500)
American Water Works Association. Annual convention. Secretary, Beekman C. Little, 29 West 39th Street, New York.

MAY 23, WEEK OF.—LONDON, ENGLAND.
International Union of Local Authorities. Congress. General Secretary, E. Vinck, Rue de la Regence, Brussels, Belgium.

Clinton, Iowa, Cleans Up with a "Pittsburgh-Des Moines" Incinerator

Thirty-eight years of municipal contracting experience guarantee community satisfaction with a "Pittsburgh-Des Moines" incinerator installation. Replace unsightly "sore spots" and infested dumps with a distinct community asset—a modern, well-built disposal plant.

There are 24 pages of interesting photographs and complete operating cost data in the "Pittsburgh-Des Moines" Incinerator Catalog. Write for it today.

HERE'S a scientific disposal plant completed and tested in June, 1931, and now in daily operation for the City of Clinton. It has two multiple-cell furnace units that can destroy 72 tons of garbage and rubbish every 24 hours. Note the dignified, yet practical design. The concrete ramps save time for unloading the city's collecting trucks and they afford quick access and exit to and from the charging floor.

There are no objectionable odors, fumes or smoke from the operation of a "Pittsburgh-Des Moines" plant. It is simple to operate—the "foolproof" furnace design permitting the employment of unskilled labor. *All of the refuse is burned as fuel to give low operating costs.*

Pittsburgh-Des Moines Steel Company

Room 941, 270 Broadway, New York, N. Y. **3452 Neville Island, Pittsburgh, Pa.**

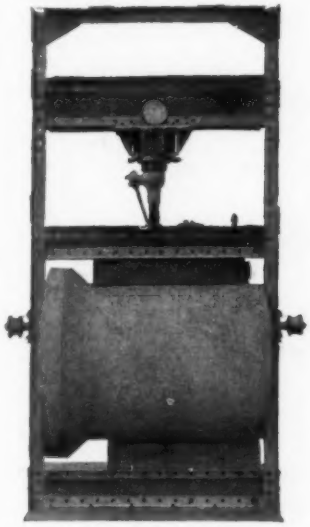
Des Moines **San Francisco** **Seattle** **Chicago** **Atlanta** **Dallas**

NEWS AND ILLUSTRATIONS

Items of Interest to City, Town and County Officials, and Others Concerned with the Economical Construction and Efficient Operation of Public Improvement Undertakings

A Portable Pipe-Testing Machine

One of the most important features of the Bratt portable pipe-testing machine sold by the Anderson Engineering Sales Co., Statler Building, Boston, Mass., is that its design and construction are such as to permit ready assembling and dis-assembling. Being made of aluminum alloy, its light weight permits it to be easily transported from point to point, when dismantled, in a Chevrolet or Ford coupé or a small truck. It is strong, rustproof and efficient, and is used with an ac-



A NEW PIPE-TESTING MACHINE

curate 50,000-pound loadometer.

The over-all size of this machine is approximately 1 foot by 5 feet by 10 feet, and its net weight is 600 pounds. The machine will handle 4-foot lengths of pipe up to 42 inches in diameter, a block and fall rigging being used for larger sizes.

struction for a permanent set-up, or may be secured as a completely assembled unit, with a patent unloading track for use in testing concrete beams, blocks, bricks and vitrified building products.

High-Pressure Water Systems

Vigilante pressure systems for deep or shallow well water supplies, made by the Vigilante Pump Co., 6225 East 14th Street, Oakland, Calif., are ruggedly constructed to stand up under continuous operation.

The pump and motor are designed for operation together, and the pump load is within the continuous allowable motor rating under all normal operating conditions. The motor is mounted above the pump to obviate the necessity of using a bearing in the pump case, to prevent the shaft from pounding out the packing, and to provide a straight, unobstructed path for the entrance of the water into the suction of the impeller. The shaft is made of stainless steel to prevent corrosion at the stuffing box, and the impeller, which is of the enclosed type, is made of bronze.

The stuffing box is packed with an asbestos, graphite and lead packing which forms a permanent seal and also acts as a bearing. The lower part of the motor bracket forms a drip basin to catch any leakage from the stuffing box, and the basin is tapped for a return drain to the well. The pump is assembled so that the impeller may be exposed for inspection or renewal without disturbing the suction or discharge pipe.

The tanks are galvanized inside and out to prevent corrosion and are of relatively high capacity to reduce the frequency of the starts and stops of the motor, which are regulated by a pressure switch. This switch protects the motor against overload and is equipped with an auxiliary manual control.

The Vigilante shallow well pressure system is inexpensive and simple to operate, and can be used when the water level is within 15 to 20 feet from the pump. If flooding is likely to occur, the pump may be located in a pit with the pressure tank at the ground level. The system is entirely automatic, occasional lubrication of the motor being the only attention required. The pumps may also be used to pump into elevated tanks.

The deep well pressure system is used when the water level is more than 15 feet below the ground surface and a pit is not desired. This system is similar to the shallow well type, except for the addition of a suction booster and the pressure return pipe and fittings. A shallow well installation can easily be converted into a deep well system. The suction booster is hydraulically operated, so that there are no moving parts in the well to require inspection or lubrication.

In operation, part of the water from the pump discharge is directed down the pressure return pipe by means of the booster control valve. The suction booster then raises the water into the suction of the centrifugal pump, which forces the water on into the pressure tank.

Ludlow Opens Canadian Factory

The Ludlow Valve Mfg. Co., of Troy, N. Y., makers of Ludlow Diamond hydrants, double-gate valves and multi-valves, will manufacture in Canada as The Canadian Ludlow Valve Mfg. Co., Ltd., with offices at 930 Wellington St., Montreal, Que., and factories at Three Rivers, Que., St. Thomas, Ont., and Fort William, Ont.

Donnelly Terminates Connection with Paradon

Announcement has been received that R. V. Donnelly has terminated his connection with the Paradon Co., of Arlington, N. J., manufacturers of chlorinators. About a year ago Mr. Donnelly disposed of his interests in the Paradon Manufacturing Co., which he had managed for several years, to a new organization known as The Paradon Co., and for the past year he has maintained his connection with the latter organization on a part-time basis. Mr. Donnelly expects, after a short vacation, to engage in some enterprise in the sanitary engineering field or an allied field.

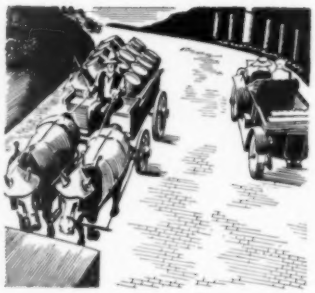
NEW METROPOLITAN V-12 AMERICAN-LA FRANCE PUMP AND HOSE CAR WITH AN 8-GALLON BOOSTER TANK DELIVERED TO WINFIELD, KANS.

This was one of the first of this new 12-cylinder series to leave the factory. Orders for 24 LaFrance V-12 cars were received in the first month following their announcement

28 Years *then Relaid with over 100% Salvage*

Lameuse Street, Biloxi, Miss. — Paved in 1896, relaid in 1924.

OVER A QUARTER of a century of service from a brick pavement. Then the bricks were taken up and relaid with more than 100% salvage! It sounds almost unbelievable, doesn't it? ♦♦ Here is the story. Lameuse Street in Biloxi, Mississippi, was paved in 1896 with 2½" x 4" x 8½" brick laid to a 4" depth. When it was relaid 28 years later the brick were turned so that the thickness was 2½". The salvage, therefore, was more than 100% and the surplus brick were used in a block of new pavement. ♦♦ This amazing pavement record is only one of hundreds which have been chalked up to the credit of brick.



Brick pavements endure. Not one has ever worn out from the top down. When they must be replaced (due ordinarily to the failure of the base) the brick can be turned over and will last indefinitely. ♦♦ For smoothness, beauty, safety, durability and economy specify brick, the oldest successful pavement and the most modern of them all.

•

THE METROPOLITAN PAVING BRICK CO.

CANTON, OHIO

Manufacturers of Metro Canton, Bessemer, Olean, and Cleveland Paving Block • Architectural Face Brick • Structural Clay Tile • Metro Trickling Filter Flooring •

BRICK PAVEMENTS

LOADING THE DRUM ONTO THE TRUCK

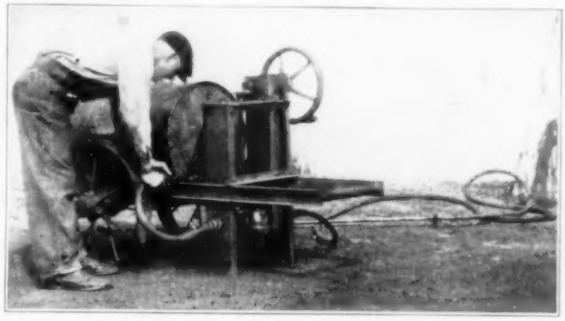
Loading an Emulsion Spray Outfit

Unit No. 93-RH hand-operated rotary gear pump emulsion spray, made by Littleford Bros., Cincinnati, Ohio, is driven by a hand wheel and a set of cut-steel bevel gears. The pump is mounted so that the material flows from the drum to the pump by gravity, making priming unnecessary. Between the pump and the spray hose is a large air chamber which effectively holds a steady pressure on the material, thereby causing an even spray.

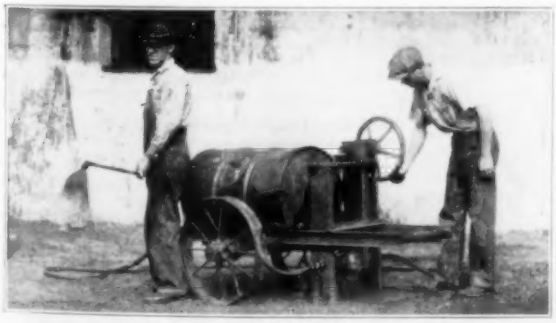
Loading this unit is a simple matter and requires only a few minutes. While the drum is in an upright position, the bung in the head is removed and replaced with the special fitting furnished with the spray outfit. This fitting has a syphon tube, a self-cleaning strainer and a shut-off valve.

The drum is then tilted back enough to allow the loading lip of the truck to pass under it. The fitting on the drum should be toward the truck. The drum is then dropped onto the cradle and the truck is lowered, the operation being much the same as loading an ordinary hand truck.

The suction hose is then connected to the special fitting on the drum, the shut-off valve is opened, and the outfit is ready for operation. Before using the outfit, the small air-hole plug in the drum head should be removed. This is done only in the case of gear pump outfits, to prevent the formation of a vacuum in the drum. The operating pressure of 10 pounds can easily be maintained by the man at the hand wheel. The strainer between the drum and the pump prevents clogging by solid material, and the pump works easily at all times.



CONNECTING THE SUCTION HOSE TO THE SPECIAL FITTING ON THE DRUM



THE 93-RH ROTARY GEAR PUMP EMULSION SPRAY IN OPERATION

A New Light-Duty Tractor

Model 15, a new light-duty general-utility tractor, has recently been announced by the Cleveland Tractor Co., Cleveland, Ohio. This new tractor is very useful to counties, towns and cities for small excavating and leveling jobs, road and street maintenance and similar work. It is also used by state and city park departments to handle such work profitably.

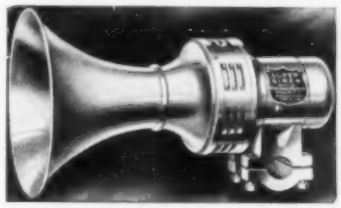
This new model has the usual Cletrac features, including power steering and exclusive gear design which keeps the power on both tracks when turning, automatic oiling positive traction and a thorough sealing of all moving parts against dust and dirt. It is powered by a 4-cylinder 4-cycle L-head motor with combined force feed and splash lubrication, a magneto with an impulse starter, a fly-ball governor, air clarifier, oil filter and rated 15-horsepower at the drawbar.

A Powerful New Siren

A large and powerful new siren designed for use on fire apparatus, police ambulances and patrols, officials' cars, etc., has recently been introduced by the Persons - Majestic Manufacturing Co., Worcester, Mass.

The Persons Super-Siren has a projector 9¼ inches in diameter at the mouth, the length of the siren with projector being 14 inches, and the diameter of the air turbine drum 5¼ inches. The motor is very powerful and revolves on ball bearings. The entire casing, projector and shoulder are made of brass, chromium-plated, and the air-turbine and drum are of aluminum, making the siren non-rusting.

Two features of the siren are the triple-slotted, tiger-toothed apertures, giving the siren a deep, piercing and far-carrying tone, and the construction of the 6- or 12-volt motor which permits the siren to gain its maximum speed and carrying power almost instantly upon touching the button.



PERSONS SUPER-SIREN

A Slide Rule for Calculating Truck Loads

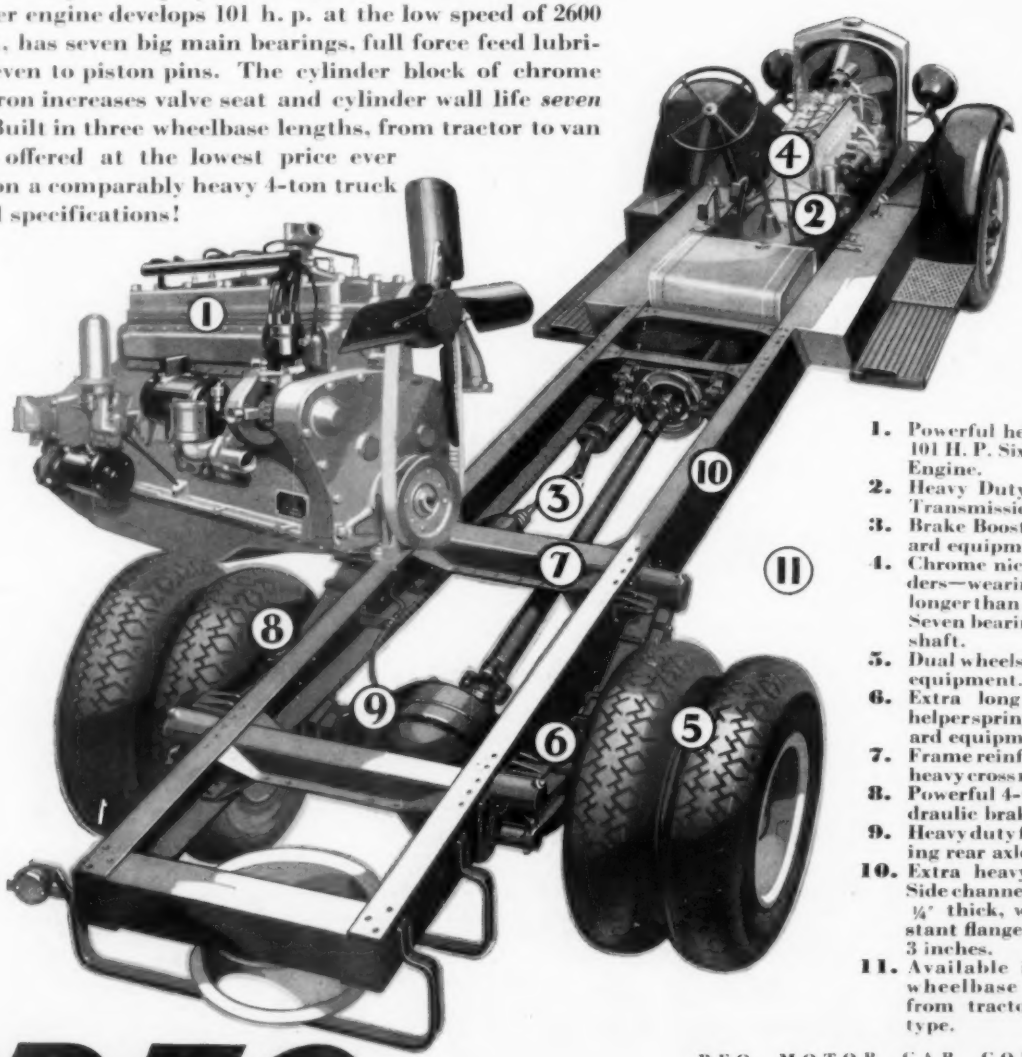
A celluloid slide-rule which tells accurately the number of gross pounds (which includes truck and load) that the Reo Gold Crown engine is capable of pulling under varying conditions, noting also tire-sizes and rear-axle ratios required, is being distributed by the Reo Motor Car Co., Lansing, Mich.

To illustrate the service which a truck operator can get from this calculator, Reo offers this example: Take the Reo model GD-3-ton truck with a dump body, 32-inch tires and a double reduction 11.78 to 1 rear axle ratio. The gross weight of the chassis and body amounts to 7,150 pounds, while the load, taking into consideration 50 per cent overload, would weigh 9,000 pounds —a total of 16,150 pounds. To illustrate the pulling power of the engine and its rapid increase in pulling power as the lower gear speeds are used, assume that it is necessary to pull several 10 per cent grades under good road conditions. Knowing the final gear ratio and tire size, the slide part of the rule is so placed as to register with the axle ratio and tire diameter. Transmission shifts are noted as 1st, 2nd, 3rd and 4th or high. With an axle ratio of 11.78 to 1, and a tire diameter of 32 inches, the figures within the slot under high gear show that the Reo engine is capable of pulling 9,342 pounds gross up a 10 per cent grade, but by moving the slide panel to third gear, the pulling power is increased to 17,199, sufficient for the load to be carried. In first gear, however, the engine is capable of pulling a load of 61,704 pounds up a 10 per cent grade. On level ground the engine is capable of pulling 575,818 pounds in first gear under favorable road conditions. All of these figures have been computed for first-class concrete highways, and it should be taken into consideration that suitable deduction for rough roads and low-grade types should be made.

THE NEW REO BIG 4 TONNER

A Truck Built to Do YOUR Job

The new Reo Big Four-Tonner is a heavy truck for heavy work, massively constructed at all vital points. It is engineered for *safe* and *profitable* high-speed travel. The Big 4-Tonner engine develops 101 h. p. at the low speed of 2600 R. P. M., has seven big main bearings, full force feed lubrication even to piston pins. The cylinder block of chrome nickel iron increases valve seat and cylinder wall life *seven times*. Built in three wheelbase lengths, from tractor to van types — offered at the lowest price ever placed on a comparably heavy 4-ton truck of equal specifications!

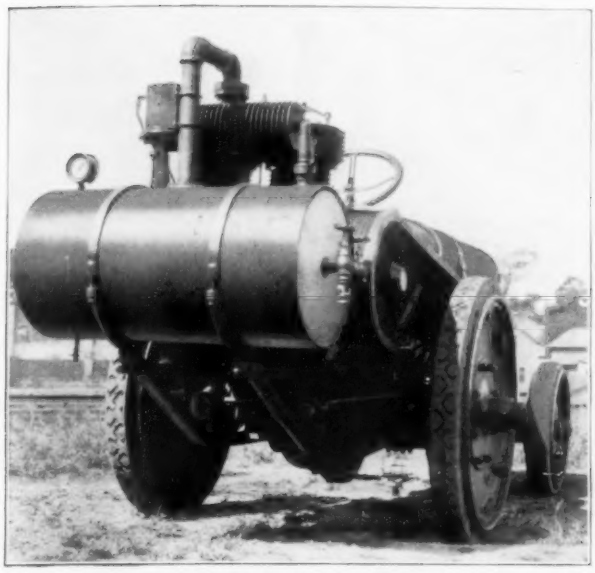


1. Powerful heavy duty, 101 H. P. Six Cylinder Engine.
2. Heavy Duty 4-speed Transmission.
3. Brake Booster standard equipment.
4. Chrome nickel cylinders—wearing 7 times longer than grey iron. Seven bearing crankshaft.
5. Dual wheels standard equipment.
6. Extra long springs; helper springs, standard equipment.
7. Frame reinforced by 7 heavy cross members.
8. Powerful 4-wheel hydraulic brakes.
9. Heavy duty full-floating rear axle.
10. Extra heavy frames. Side channels 10″ deep ¼″ thick, with constant flange width of 3 inches.
11. Available in three wheelbase lengths from tractor to van type.

REO MOTOR CAR COMPANY
LANSING — TORONTO

150-inch wheelbase chassis . . . $2800
170-inch wheelbase chassis . . . $2875
190-inch wheelbase chassis . . . $2950
f. o. b. Lansing

REO BIG 4 TONNER $2800



DAVEY AIR-COOLED COMPRESSOR

An Air-Cooled Compressor

Light in weight, simply designed and of compact construction, the Davey air-cooled compressor, made by the Davey Compressor Co., Kent, Ohio, is easy to maintain and economical to operate. Used with a McCormick-Deering industrial tractor, it can go wherever work is to be done, under its own power, and can draw a load if necessary. It combines a liberal air supply with freedom from overheating in summer and from freezing in winter.

The compressor is of the 2-cylinder, vertical type, is air-cooled and compact, and requires minimum space. It has a dust-proof, removable side plate for inspection of connecting rod bearings and other working parts, and is of simple design throughout. It has a two-part, semi-steel crank case, the three main bearings being bored and line-reamed for perfect alignment and to reduce friction. The oil return is cast integral with the lower half of the crank case.

The cylinder heads are made of high heat-conducting material, carefully machined and designed to provide minimum clearance to add to the over-all efficiency or air output. Pressure-feed lubrication through a gear-driven geared-type oil pump insures thorough oiling of each bearing.

The compressor has a stroke of 6 inches, a bore of 6 inches, a speed of 725 r.p.m. and a piston displacement capacity of 142 cubic feet per minute. The rotation is either clockwise or counter-clockwise. The weight of the compressor unit is 490 pounds, and complete, ready for mounting, it weighs 1,000 pounds.

A Road Marker and Spray Painting Machine

Self-propelled and completely equipped for its work of marking streets, highways, and safety and parking zones for the efficient regulation of motor traffic, the Harley-Davidson road marker and spray painting machine, made by the Harley-Davidson Motor Co., Milwaukee, Wis., will mark many miles of pavement per day, making clean-cut straight lines or accurate curves.

The motorcycle is equipped with a reverse gear for maximum mobility in city street marking, and paint spray equipment, consisting of air compressor driven by the Harley-Davidson gasoline power unit, air tank, paint container and spray gun. This equipment is conveniently mounted on a special sidecar of rugged construction and all parts are easily accessible. The spray gun is mounted in a special spray guard which accurately defines the width of the line and gives the operator control of its direction.

With an extra length of air and paint hose, the machine can be used for painting guard rails, signs, bridges, buildings, etc., as well as for general maintenance work.

The 21-cubic-inch Harley-Davidson single-cylinder, air-cooled gasoline motor has speed-control governor, gasoline and oil tanks and a special lever starter. The 2-cylinder air compressor unit has a capacity of 11 cubic feet and is run by a V-belt drive from the motor. It is fitted with an automatic unloader and pressure regulator. The tested air storage tank is 7 inches in diameter by 22 inches long and is fitted with a safety valve, pressure gage and drain cock. The pressure paint tank has a removable 10-gallon container and agitator.

A New Model Gas Hammer

A new model gas hammer which weighs only 86 pounds and yet has considerably more power than its former model has been announced by the Rodax Corporation, Chicago, Ill.

In this new hammer the oil-cooling chamber and horizontal and movable fins have been eliminated, the cylinder now being air-cooled with vertical fins. This simple two-cycle hammer is complete in itself and needs no additional equipment, permitting it to be used for cutting out sections of pavement where repairs are to be made or for tamping new pavement, in places where it was formerly impossible or uneconomical to use the larger mechanical equipment.

THE RODAX IN ACTION

THE HARLEY-DAVIDSON ROAD MARKER

Illinois Resurfaces

63 23/100 MILES WITH BRICK

ILLINOIS began a brilliant chapter in highway economy this year, by widening and resurfacing worn concrete roads with brick.

A total of 63.23 miles constituted the initial program.

Thus, slabs that have not too far approached the end of their usefulness are being saved for many years to come. *Brick* pavements built 30 and 40 years ago are in constant use today, although not nearly so well constructed as these Illinois brick resurfaced sections.

The economy and sound judgment in resurfacing with brick is apparent. The worn concrete—unsatisfactory as a pavement—will make a good base on a subgrade that has received its full settlement. Mastic cushion and bituminous filled brick surface prevent transmission of cracks. Weather and traffic will have no effect on the brick surface. The existing slab has been transformed into a low-maintenance road extraordinarily well suited to all traffic.

Highway engineers, officials and taxpayers will find much of interest in this Illinois work.

Further information on resurfacing with brick may be had by addressing the National Paving Brick Association, 1245 National Press Building, Washington, D. C.

Completed brick resurfacing of worn concrete by Illinois State Highway Department on Route 4 south of Springfield. This gives the highest type highway at low cost.

Worn slab being prepared for curb and brick resurfacing.

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Photos by courtesy of Division of Highways, State of Illinois

VITRIFIED

BRICK PAVEMENTS

FACE THE FUTURE « » PAVE WITH BRICK

Light Snow-Plows for Passenger Cars or Light Trucks

Three different models of light snow-plows which can be operated by passenger cars or light trucks and which can be attached in a few minutes are manufactured by the Empire Plow Co., Cleveland, Ohio.

The V-81 Model offers inexpensive and efficient snow removal for drives and roadways of cemeteries, estates, public and private institutions, and small villages or townships. It is of heavy-gage all-steel construction, weighs about 340 pounds and is simple to operate. The nose of the plow rides on a self-steering steel runner at the front and, as the car carries almost none of the weight of the plow, it has plenty of power for pushing. The V-shape readily cuts through the snow, rolling it to either side, and will go through fairly deep snow with little resistance. Being 81 inches wide at the widest point, it clears a path well beyond the car wheels, and a wider road can be opened by banking either or both sides. The plow can be stored in a space of approximately 5 x 2 feet and can be handled by one man.

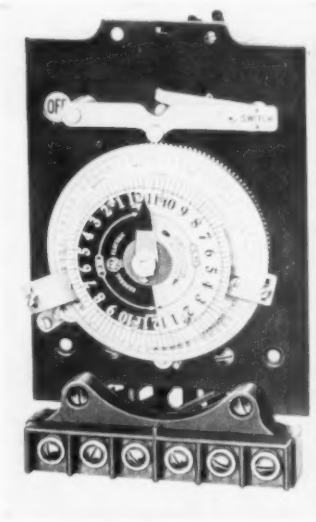
A TRUCK-MOUNTED SNOW-PLOW

The Auto Snow Shovel, a light straight-blade plow, pushes the snow straight ahead or to either side and can be carried on the bumper of the car from one job to another. It is made for use on smooth surfaces and at low speeds and is an inexpensive, easily handled plow. It is recommended for filling stations, parking lots, loading platforms, concrete driveways and other smoothly surfaced areas.

The light, but strong, Speed Plow is quite different in design and construction and is carried on the front of the car and off the ground, so that only the snow that materially interferes with the progress of the car is moved. It is not designed for snow removal, but for use as a drift-breaker to enable the car to get through deeply drifted snow that would otherwise be impassable.

This plow is recommended for use on busses, ambulances, fire trucks and delivery service of all kinds in outlying districts and is made in sizes for passenger cars and for single and dual-tired trucks and busses.

All models are attractively finished in yellow and black.



THE NEW GE TYPE T-13 TIME SWITCH EQUIPPED WITH ASTRONOMIC DIAL, WITHOUT CASE

A Versatile Time Switch

A new switch, recently brought out by the General Electric Co., Schenectady, N. Y., will turn lights on and off at dusk and at dawn, or at any predetermined time before or after sunrise and sunset, making due allowance for geographical latitude and for the season of the year. It can be made to omit operations on any desired days of the week and can perform such operations as starting motors in the morning, starting and stopping them throughout the day, according to schedule, and shutting them down at the end of the day. It is available in various designs for different tasks.

Three features of the new time switch, designated as GE Type T-13, are the use of the GE Telechron motor for timing the device, mercury-to-mercury Kon-nector switches and the availability of astronomic dials, corrected for latitude. It is designed for alternating current circuits of 115 volts and 30 amperes or 230 volts and 15 amperes current carrying capacity. It is available in single or double pole, both single or double throw, and with either a plain or an astronomic dial. The housing is such that the time switch can be used for either indoor or outdoor service. The case measures 10 5/16 inches in height, 5⅜ inches in width and 5 inches in depth, and the instrument weighs 6½ pounds.

New Loader Handles Three Cubic Yards per Minute

Operators of fleets of large-capacity trucks have constantly demanded loaders of larger and greater capacity in order that truck-loading time might be reduced to a minimum and the cost of empty trucks awaiting their turn at the loader might be saved. The Geo. Haiss Mfg. Co., Park Ave. and 142nd St., New York City, has recently introduced the new Haiss Model 80 loader, a heavier, stronger and more powerful loader, which has a demonstrated average capacity in excess of 3 cubic yards per minute. One large New York City operator of sand and gravel yards reports a loading time of 3½ minutes putting up 15 consecutive runs of 12-cubic-yard loads of crushed stone.

This new loader has a 60-horsepower, 6-cylinder engine, with intake air cleaner, oil filter, gasoline strainer and inbuilt throttling governor. It has a fully-enclosed transmission, with all gears running in oil. It has the patented Haiss 3-foot-per-minute crowding speed and patented revolving-propeller feeding device. The buckets, measuring 22 x 12 inches x 10 inches, are toothed for easier digging. The bucket elevator is interchangeable with a flight-conveyor snow-boom for winter snow-loading.

The weight of the new machine is 16,500 pounds. Manganese steel is used at vital parts to reduce maintenance and replacement costs. In spite of its great size and enormous capacity, the Model 80 is reported to be exceptionally easy to operate, with only 6 controls, each motion requiring only one hand-movement. A skilled operator is not required, as it has been demonstrated that a few hours' experience will assure efficient operation.

THE NEW 3-CUBIC-YARD-PER-MINUTE LOADER

New Snow-Plow for Sidewalk Work

A pivoted V-type snow-plow for sidewalk work, which is provided with a device which enables either side of the plow to swing in when striking posts, lot-stakes or trees along the edge of the walk, has been developed by the Root Spring Scraper Co., Kalamazoo, Mich. Sidewalk snow-removal is much more satisfactorily handled with a motor truck than with the ordinary tractor or horse-drawn plow, according to the manufacturer, as the snow is thrown away from the walk where it cannot drift in again.

By dropping a pin in the pivoting mechanism, the plow can be held rigid for street or alley use. It can be quickly detached when the storm is over. The use of this plow will not injure the truck, as all of the push is taken at a point just back of the cab at two places on the chassis frame. The plow is readily adaptable to such motor equipment as is already at hand.

Prices — f. o. b. Peoria, Illinois

TEN . . . $1100 TWENTY . $1900
FIFTEEN . $1450 THIRTY . $2375
SIXTY . . $4175

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.
Track-type Tractors Combines Road Machinery
(There's a "Caterpillar" Dealer Near You)

HERE'S a "Caterpillar" Ten Tractor leveling for the laying of a concrete apron in front of the depot and administration building — Boeing Field, West Seattle, Wash. There are five sizes of the "Caterpillar" Tractor —a size for every airport use—a hundred uses for every size — from the Ten, handy unit for towing planes, hauling material, maintenance, to the Sixty for heavy construction, maintenance, snow clearing.

CATERPILLAR

REG. U. S. PAT. OFF.

TRACTOR

When you write for that catalog, kindly mention THE AMERICAN CITY

THE NEWAYGO TRAFFIC LINE MARKER

A Time-Saving Traffic Line Marker

A traffic line marker in which the painting liquid is held at a fixed level in the reservoir in front of the paint tank by vacuum, is made by the Newaygo Engineering Co., Newaygo, Mich. From the reservoir the paint is picked up by an idler wheel dipping into it and spreading it onto the marking wheel. The marking wheel in turn rolls the paint upon the surface to be marked. The amount of paint carried onto the marker wheel is governed by a thumb nut which applies pressure on the idler wheel, causing a wringing action and squeezing off the excess paint which flows back into the reservoir.

The marker wheel, which is about 4 inches wide, is made of cast iron and covered with a heavy application of felt over which a heavy band of rubber is stretched. In this way the felt cushion is protected, and the paint pigment will not fill it up and cause it to stiffen or harden and loose its cushioning effect. Over the outside of the rubber band is laced a heavy felt cloth, which takes the paint from the idler wheel and delivers it onto the surface to be marked.

These markers may be taken entirely apart in 5 minutes and thoroughly cleaned. One man can lift it in or out of a car easily, as the shipping weight, crated, is only 100 pounds. The handles are of wood and can be easily raised or lowered to meet the convenience of the operator. They will operate with any kind of paint or lacquer. The paint tank has a capacity of from 4 to 5 gallons.

Graders for Snow-Removal Work

For snow-removal work in conjunction with large push-type plows, the Gilbert quick-detachable road graders and maintainers made by the Gilbert Manufacturing Co., Stillwater, Minn., are much used by counties, townships and municipalities. This outfit travels much faster than the heavier units and will take care of keeping the roads and streets open while the big plow is working in heavy drifts elsewhere. The outfit can be converted into a grader maintainer for regular maintenance work in an hour's time. The scarifier attachment can be lifted up out of the way when not in use, and the machine can be furnished with cab curtains or glass enclosure as desired.

The extension snow moldboard for use with this grader has been developed after many years of experiment. It fits the standard moldboard and can be removed in a few minutes' time. The entire attachment is of steel, heavily reinforced. The front wheels used on the grader when engaged in snow removal do not allow the machine to slip to one side but cut through the ice and snow, making the machine very easy to handle. These wheels are furnished without bearings and can be slipped on over the regular wheel bearing in a very short time. They are made of steel and built to withstand hard usage. Gilbert patented snow chains consist of two sets of steel rings bolted to the wheel. To put them on, it is only necessary to unscrew a bolt, insert the link end of the chain through the hole on the rim, put the pin through this link, and tighten up. Any number of chains can be put on as needed.

A Valve of New Design

Erosion of a valve seat is due chiefly to high velocity and density of the fluid handled and the presence of scale and other solids. Erosion is most pronounced in a valve opening of less than 0.0001-inch. From this point up to 3/32-inch opening, erosion gradually disappears. Since the opening must increase in size from 0 to full flow, some erosion takes place each time the valve is opened or closed. Any valve with a single seat is subject to the full pressure drop across its seating face. To correct this, the Ludlow Valve Manufacturing Co., Troy, N. Y., has designed the Ludlow Multi-Valve, which, by reducing the pressure step by step through control of expansion and back-pressure, decreases the density and velocity of the flow to the point where its kinetic energy can be resisted by existing materials.

Instead of the usual single seat, the new valve employs five or more, and instead of the usual drop from full pressure to atmosphere, each contact opens into an expansion chamber in which pressure is partially released, density partially lowered, and velocity lowered and further reduced. The Multi-Stage Cone of this new valve affords a metal-on-metal seating that cuts through scale and viscous liquids and insures a positive shut-off that will not simmer; a multi-stage opening action that reduces velocity and density by successive expansion and cushioning, thus throttling without erosion; and a multi-seat principle that insures a tight seal with all fluids, and at all temperatures and pressures, that prevents distortion and that cleans its seat at each closing.

These valves are adapted to use in boiler-feed connections, in high-pressure steam, air and water lines and in many difficult throttling and pressure-reducing services. The design of the valve has all the features essential to a blow-off valve, a throttle valve, a drain valve and a stop valve.

International-Stacey Corporation Opens a St. Louis Office

Announcement has come from the general office of the International-Stacey Corporation, Columbus, Ohio, that B. H. Ehrnman, who was formerly in the Chicago office of the company, has been transferred to the St. Louis office, with offices in Room 2192, Railway Exchange Building. Mr. Ehrnman will have charge of the sale of Ideco Standard Building, Ideco airport and airway equipment, and Ideco electrical equipment.

GILBERT QUICK-DETACHABLE GRADER IN USE FOR SNOW REMOVAL

WHAT IS THE VALUE OF

HUMAN CONTACT?

THE *cost* of telephoning is as little as it can be made. Its *value* can be infinite.

If it is worth your while to save time, to be in touch with people at a distance, to do business quickly, to keep in touch with friends and family—if such things have a value, the telephone holds limitless possibilities for you.

It is the means of extending your personality. Unlike commodities, telephone calls cannot be made wholesale. Each one is a personal service. Each goes when and where you wish. At your request you have five thousand or five million dollars' worth of property at your command, two or three people or perhaps a hundred attending the wires along which your voice travels. It is the work of the Bell System to do this well and cheaply. Its hundreds of thousands of trained workers must keep every part of its 4000 million dollars' worth of equipment ready for instant use.

Here is a business run on the smallest margin of profit consistent with service, security and expansion. Its operation and maintenance have the benefit of the continual research of the 5000 members of Bell Laboratories, the general and technical staff work of the American Telephone and Telegraph Company, and the production economies effected by Western Electric.

Every resource of the Bell System is devoted to making your service clear, quick and inexpensive. As new telephones are added, as improvements are made, you get constantly greater satisfaction and value.

★ *AMERICAN TELEPHONE AND TELEGRAPH COMPANY* ★

A BALLISTIC MICROSCOPE

Apparatus for the Study of Forensic Ballistics

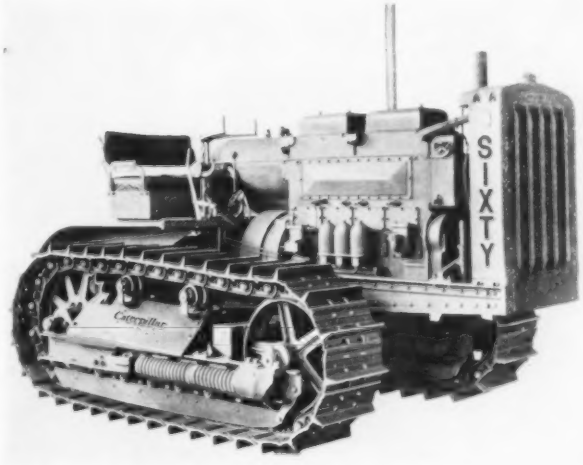
Forensic ballistics, the science of comparison and identification of firearms, bullets, etc., is being successfully used by the identification bureaus of police departments of cities all over the country. The Spencer Lens Co., Buffalo, N. Y., has developed a complete line of specially designed apparatus for the comparison of bullets, shells—both pistol and shotgun—fingerprints, documents, handwriting, etc., which is portable, serviceable and practical.

Spencer bullet comparison microscopes are really two microscopes connected by a comparison eyepiece, each equipped with specially designed mechanical stages for holding and orienting the bullets. This eyepiece contains an ingenious arangement of prisms and lenses that combines the two images side by side, separated only by a hairline, and makes them appear as one bullet. When examining bullets or shells, the fatal bullet is placed under one microscope and the test bullet under the other, the result being a composite bullet image, one-half of which is contributed by the fatal and the other half by the test bullet. One bullet remains stationary in view while the other is rotated slowly as the width and angles of pitch of the lands, grooves and other outside markings are compared. Where these seem to fuse one with the other, they are both revolved slowly, simultaneously, to check for further comparison through their entire circumference. These microscopes are made in two sizes.

The New Caterpillar Diesel Tractor

To produce a diesel engine which will operate under widely varying conditions and always in the midst of dust and dirt was the problem faced by the Caterpillar Tractor Co., Peoria, Ill., when it started to develop its new line of diesel-powered Caterpillar tractors. The outstanding contribution in this new engine is the complete removal of all field adjustments and timing features from the fuel injection apparatus. By specially designed instruments and machines, the fuel injection apparatus is adjusted, regulated, and timed in the factory. The assembled units are then sealed, and are replaceable in Caterpillar diesels. A complete set of spare fuel injection apparatus accompanies each diesel engine, so that replacement can be made in the event of any difficulty with the originally installed apparatus without the necessity of the delicate work of timing, adjusting or regulating.

Caterpillar has set for itself a new standard for diesel engines in the complete inclosure and dustproofing of the vital operating parts. This has been accomplished without minimizing accessibility and without endangering lubrication by contamination from fuel system leakage. The same simple operating control is provided as used on gasoline tractor engines. There is also included a variable speed governor control which provides acceleration and flexibility even surpassing gasoline tractor practice, according to Caterpillar's report.

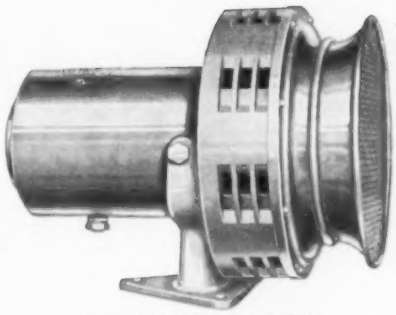


A CATERPILLAR SIXTY EQUIPPED WITH DIESEL ENGINE DRIVE

The chief problem which was faced by the Caterpillar Tractor Co. in its new diesel was to develop a fuel-injection apparatus so coordinated with the combustion process that it would operate entirely successfully. The engine is designed to maintain its rated full load over extended periods of operation, to preserve combustion efficiency and maintain balanced firing at light loads, and to provide variable load with satisfactory combustion quality, to provide smooth operation over the entire operating range by eliminating combustion roughness and detonation, to reduce maintenance cost to a minimum by extending the life of exhaust valves, cylinders, piston and bearings, and to provide simple operating controls.

A Free-Rolling Siren

A free-rolling electric siren of the coasting type, in which the motor coasts after the power has been shut off, is being made by the Sterling Siren Fire Alarm Co., Inc., Rochester, N. Y., for fire apparatus. To produce this coasting effect, no clutches are used nor are the brushes lifted. The siren with a full ball-bearing motor built directly into the siren itself makes a compact, rigid unit. The motor has a large commutator and oversize brushes, which insure long life, as these parts are essential to any electrical siren.



THE NEW STERLING FREE-ROLLING SIREN

The new free-rolling siren is 8 inches in diameter and uses the same type of ports as in the smaller sizes. The ports are machined accurately for greater efficiency and sound production, and are slotted to prevent the possibility of any one's getting his fingers into the revolving parts. The projector is made of heavy sheet brass, as is also the motor housing, so that neither will be affected by vibration. These parts are all hand-spun to produce the proper shapes and sizes. A screen is used in the projector as standard equipment to prevent stone, bugs and dirt from getting into the moving parts and preventing them from operating. The fan and fan housing are made from Number 12 aluminum, and the brackets are made from manganese bronze.

The Sterling free-rolling siren gives a very penetrating tone that is noticeable even in heavy traffic. The city of Rochester recently placed an order for 48 of these sirens as standard equipment for the Fire Department after the Department had tested one of the units for six months.

30,000 Bleachers to Order

For the convention of the American Legion in September in Detroit, the Detroit Atlas Portable Bleacher Co. furnished 30,000 seats in portable bleacher form. These bleachers are found in numerous school athletic fields, church gymnasiums, city parks and college stadiums, are quickly set up and as easily taken down, and occupy a minimum of space in storage.

Outdoor Lighting

A Section of *The American City*
Devoted to the Lighting of Streets, Highways, Airports, Athletic Fields and Parks, and the Floodlighting of Public Buildings

Owensboro's New White Way System

By **A. L. BISHOP**
Superintendent,
Municipal Light and Water Plants

OWENSBORO, KY., has just celebrated the installation of a White Way lighting system. It consists of 174 lighting posts placed eight to a block in the business section. The posts are of cast iron, 12 feet in height and octagonal in design. They were cast by the Owensboro Foundry Co., which also furnished other material used in constructing the system. Each standard contains a 6,000-lumen Mazda bulb in glassware of State Capitol design. The glassware was made by the Line Material Co., as were the 10,000-volt insulating transformers. The 10,000-volt cable, wire conduit and 6,000-lumen bulbs were manufactured by the Westinghouse Electric & Manufacturing Co.

The system is a two-circuit series, with insulating transformers in each standard, and a disconnecting pothead. It is controlled at the switchboard at the municipal plant, and one-half of the lights are turned off at midnight. The voltage underground is 5,000, and at the insulating transformers, 80 volts. The entire installation cost $16,800 and was made with local labor, under the supervision of the Superintendent of the Municipal Light and Water Plants. It was not necessary for the city to borrow money to finance this improvement, as it was paid for by the city from the General Revenue Fund.

Because the light plant is municipally owned, Owensboro makes no direct payments for the electric current used in street lighting. The light plant and the water plant earn profits which amount to more than $75,000 a year after costs and extensions have been paid for. The profits are put into the General Revenue Fund, thereby reducing the need for funds derived from taxation to be applied to the work of other municipal departments which are not self-supporting.

The municipal electric plant represents an investment of more than two million dollars, without any indebtedness. There has never been a bond issue for any improvements or extensions to the plant. It was originally started thirty years ago with an appropriation of $50,000 from the general revenue of the city. This original appropriation has been repaid many times over, and the plant has been built up to its present size and efficiency from its profits. The rates have at all times been lower than those in most cities. The average peak load carried by the plant at the present time is 3,400 kilowatts. The annual consumption of electricity during the past year was 13,501,750 kilowatts.

The Owensboro Chamber of Commerce, of which W. J. Hanning is Secretary, actively supported the building of the White Way.

FREDERICA STREET, OWENSBORO, AT NIGHT, AND (ABOVE) ONE OF THE WHITE-WAY STANDARDS

Lighting on the Sunrise Highway of Long Island

(Concluded from the September Issue)

Rockville Centre

Adjacent to the eastern boundary of Lynbrook is the village of Rockville Centre, through which the highway extends

ONE OF THE LIGHTING STANDARDS ON THE SUNRISE HIGHWAY IN ROCKVILLE CENTRE, N. Y.

for about 9,600 feet. For this entire distance the highway is lighted by 136 ornamental units on Union Metal steel poles, No. 3761, in staggered arrangement, with an average of about 140 feet between units on each side of the street. The luminaire is Novalux Form 16 with rippled globe, the light center being 17 feet 10 inches above the pavement. In the built-up section 1,000-cp. lamps are used, and 600-cp. elsewhere. The latter can be replaced by 1,000-cp. lamps when desired. The greater portion of the lighting in question was installed in 1929 and the remainder in 1930, the total cost being about $45,000. The installation was paid for out of the earnings of the Rockville Centre municipal lighting plant.

Lack of Uniformity

Attempts have been made to bring about a greater degree of uniformity on the highway, but as long as the financial end is left entirely to the municipalities involved, such efforts do not seem likely to succeed. If the state were to consider the lighting as an integral part of the highway, uniformity in lighting would naturally follow, with the installation made at the expense of the state itself. It is reasonable to suppose that with the first cost out of the way, the municipalities would be found ready to cooperate on the operation and maintenance of the system.

Adequacy of Illumination

In the street lighting code of the Illuminating Engineering Society the minimum recommendations for highway lighting are, for mounting height, 22 feet (with 28 feet preferred), and for lamp intensity, 4,000 lumens (400 c.p.) at 325-foot spacing.* This gives a minimum of 12.3 lumens per linear foot of highway. It is interesting to note that the only portion where the mounting height reaches 22 feet is in New York City. In all four communities for which data are given the average lumens per linear foot exceed the above minimum, the lowest figure being 14.3. However, the code states that for broad highways carrying heavy traffic, thoroughfare requirements should prevail. The latter call for lighting intensities as follows: For heavy traffic, 10,000-lumen lamps placed opposite and spaced 150 feet apart (thus giving 133.3 lumens per linear foot); for medium traffic, 10,000-lumen lamps, staggered, 150-foot spacing (giving 66.7 lumens per foot); for light traffic, 4,000-lumen lamps, staggered, with 150-foot spacing (giving 26.7 lumens per foot). Furthermore, the code prescribes that for the minimum recommendations given, the lamps should be mounted over the pavement rather than back of its edges; and this condition is not attained on the Sunrise Highway, except with the center-suspension type; even the bracket mountings do not bring the lamps over the pavement effectively, if at all. As the highway is heavily traveled, frequently at night, the lighting intensities in use are none too adequate. Even in Rockville Centre, with 142 lumens per foot, the standard of lighting is by no means excessive if the highway be viewed as a heavy-traffic thoroughfare.

* See page 146.

Lighting Equipment for Athletics

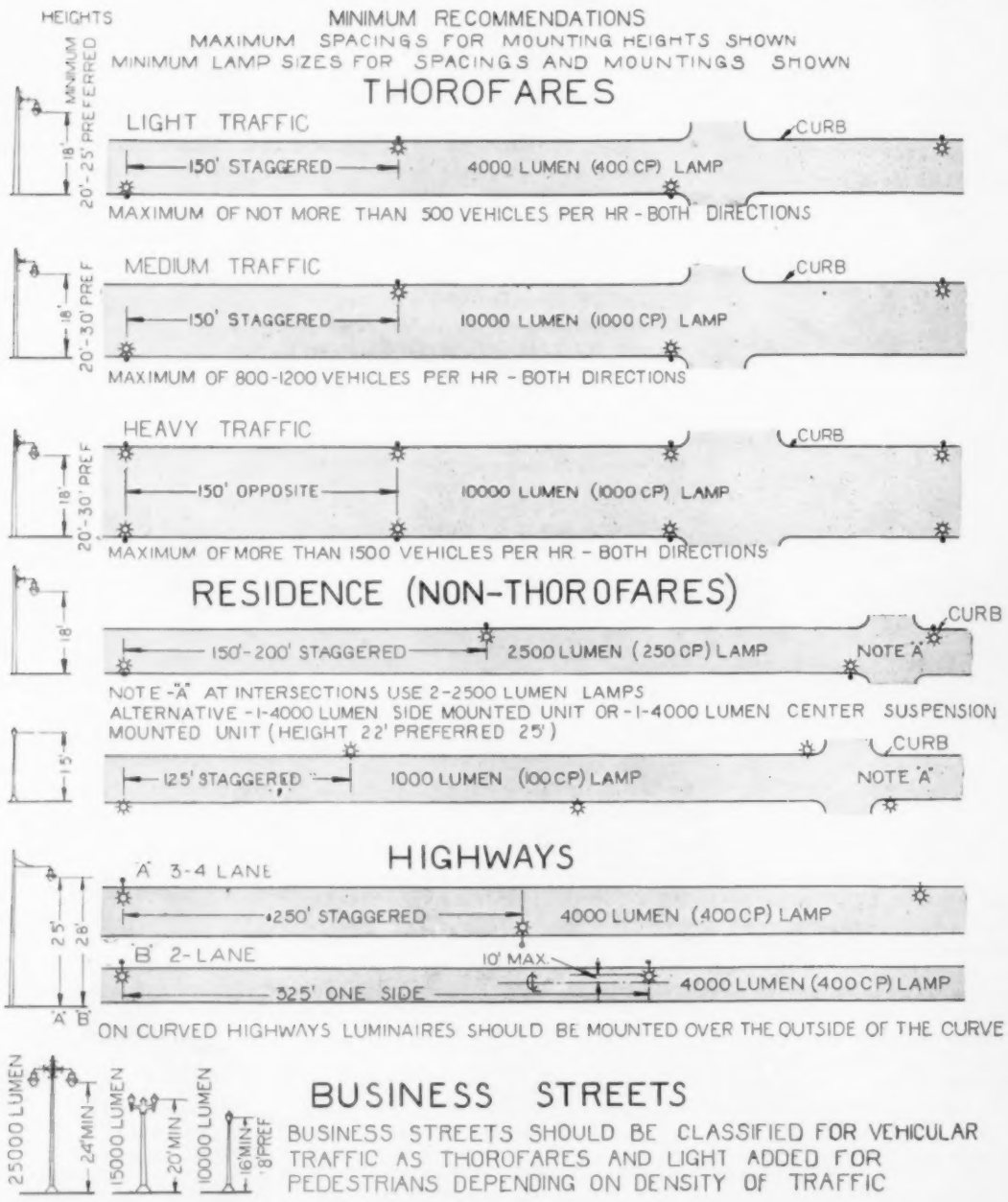
SEVERAL hundred kilowatts have been added to the load of the power company in Waterloo, Iowa, a city of 30,000, by the installation of a number of Giant floodlights for night athletics. The Waterloo baseball club has an installation of 40 projectors with a total of 183,000 watts. The West High School football field is lighted with 16 units totaling 48,000 watts, and the East High School has recently installed equipment having the same number of watts. Two swimming pools, an amusement park and miniature golf courses also have floodlight installations, which indicates the possibilities of outdoor lighting for recreation even in the smaller towns.

An additional use of illumination for athletics is offered by a new illuminated scoreboard operated by remote control. The scoreboard marketed by the Giant Manufacturing Co. tells at a glance the official score and minutes to play in each period. The official timekeeper operates the remote control board with four push-buttons. One or two scoreboards can be placed in an auditorium and both operated by the timekeeper.

The mechanism consists of a minimum of working parts, all of which are mounted on an assembly frame that can be readily removed. One 1/30-hp., 110-volt motor provides power to all indicators. The face of the board is transparent fiberloid and is unbreakable. It is illuminated from indirect light sources, all glare being eliminated from the numbers. The cabinet is finished in highly polished dark mahogany. The board is 54 inches wide by 66 inches high, and the numbers on the score indicators, 4 by 5 inches, can easily be read at 300 feet.

A NEW ILLUMINATED BASKETBALL SCOREBOARD

A Visualization of the Street Lighting Code of the Illuminating Engineering Society


HEIGHTS
MINIMUM RECOMMENDATIONS
MAXIMUM SPACINGS FOR MOUNTING HEIGHTS SHOWN
MINIMUM LAMP SIZES FOR SPACINGS AND MOUNTINGS SHOWN
THOROFARES
LIGHT TRAFFIC
CURB
18' MINIMUM 20'-25' PREFERRED
150' STAGGERED
4000 LUMEN (400 CP) LAMP
MAXIMUM OF NOT MORE THAN 500 VEHICLES PER HR - BOTH DIRECTIONS
MEDIUM TRAFFIC
CURB
18' 20'-30' PREF
150' STAGGERED
10000 LUMEN (1000 CP) LAMP
MAXIMUM OF 800-1200 VEHICLES PER HR - BOTH DIRECTIONS
HEAVY TRAFFIC
CURB
18' 20'-30' PREF
150' OPPOSITE
10000 LUMEN (1000 CP) LAMP
MAXIMUM OF MORE THAN 1500 VEHICLES PER HR - BOTH DIRECTIONS
RESIDENCE (NON-THOROFARES)
18'
CURB
150'-200' STAGGERED
2500 LUMEN (250 CP) LAMP
NOTE 'A'
NOTE -'A' AT INTERSECTIONS USE 2-2500 LUMEN LAMPS
ALTERNATIVE - 1-4000 LUMEN SIDE MOUNTED UNIT OR - 1-4000 LUMEN CENTER SUSPENSION MOUNTED UNIT (HEIGHT 22' PREFERRED 25')
15'
CURB
125' STAGGERED
1000 LUMEN (100 CP) LAMP
NOTE 'A'
HIGHWAYS
25' 28'
'A' 3-4 LANE
250' STAGGERED
4000 LUMEN (400 CP) LAMP
'B' 2-LANE
10' MAX.
325' ONE SIDE
4000 LUMEN (400 CP) LAMP
'A' 'B'
ON CURVED HIGHWAYS LUMINAIRES SHOULD BE MOUNTED OVER THE OUTSIDE OF THE CURVE
25000 LUMEN
24' MIN
15000 LUMEN
20' MIN
10000 LUMEN
16' MIN - 8' PREF
BUSINESS STREETS
BUSINESS STREETS SHOULD BE CLASSIFIED FOR VEHICULAR TRAFFIC AS THOROFARES AND LIGHT ADDED FOR PEDESTRIANS DEPENDING ON DENSITY OF TRAFFIC

TO facilitate the study of the Illuminating Engineering Society's Code of Street Lighting, the Code recommendations have been put into chart form, as shown above, by A. F. Dickerson, Chief Engineer of the Illuminating Engineering Laboratory of the General Electric Co. The recommendations are based on the most effective equipment used in the most effective manner, and specify the minimum requirements of lighting for safety. The text of the Code should be consulted for details concerning the requirements (see THE AMERICAN CITY, November, 1930, page 149).

The Street Lighting Committee, which prepared the Code, is composed of representatives of municipalities, universities, laboratories, central stations, electrical manufacturers and consulting engineers, and the Code is the result of several years of intensive work in the form of discussions, tests and actual observations on the streets of many cities. In most cases the cities represented by the municipal members of the Committee are using more light than that specified by the Code.

The chart has received the approval of the Street Lighting Committee, having been submitted to the members and revised in the light of their suggestions. Copies may be obtained from THE AMERICAN CITY.

CORRECTION FOR BUFFALO LIGHTING COSTS

A TYPOGRAPHICAL error in the figures furnished THE AMERICAN CITY on street-lighting costs in Buffalo led to a misstatement in the August, 1931, issue, page 146. The cost of electric lighting for that city should have been given as $1,007,230, which necessitates the following additional corrections: cost per square mile, $23,981; cost per mile of streets, $1,770; cost per person, $1.67.

$7,000,000 City Hall, Buffalo, N. Y.
(See page 141)

NOV 9 - 1931

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50 Cents, $4 a Year

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The American City